VOLUME II

TABLE OF CONTENTS
IMPROVEMENT STANDARDS

CITY OF ROCKLIN

DEPARTMENT OF PUBLIC WORKS

IMPROVEMENT STANDARDS

SECTION 1

PURPOSE AND DEFINITIONS

1-1 PURPOSE -- It is the purpose of these Improvement Standards to provide standards to be applied to improvements and private works to be dedicated to the public and accepted by the City for maintenance or operation, as well as improvements to be installed within existing rights of way and easements. This is necessary in order to provide for coordinated development of required facilities to be used by and for the protection of the public. These Standards shall apply to regulate and guide the design and preparation of plans for construction of streets, highways, alleys, drainage, street lighting facilities and related public improvements, and set guidelines for all private works which involve drainage, grading, trees, and related improvements.

1.2 DESIGN PRACTICE -- It is recognized that it is not humanly possible to anticipate all situations that may arise or to prescribe standards applicable to every situation. Therefore, any items or situations not included in these Improvement Standards shall be designed in accordance with accepted engineering practice, the City of Rocklin Standard Construction Specifications, the State of California "Highway Design Manual" and "Traffic Manual", and as required by the Director of Public Works.

1.3 DEFINITIONS -- Whenever the following terms or titles are used in these standards, or in any document or instrument where these standards govern, the intent and meaning shall be as specified in the City of Rocklin Standard Construction Specifications, the Rocklin Municipal Code, and as herein defined:

Consulting Engineer -- Shall mean any person or persons, firm, partnerships or corporation legally authorized to practice civil, mechanical or electrical engineering in the State of California who prepares or submits improvement plans and specifications to the City of Rocklin Department of Public Works for approval.

Developer -- Shall mean any person or persons, firm, partnership, corporation, or combination thereof, financially responsible for the work involved.

Development -- Shall mean the act or process of any construction on properties as well as subdivision improvements.

Director -- Shall mean the Director of Public Works of the City of Rocklin acting either directly or through others in the Department of Public Works or his

authorized representatives. Director shall also mean the City Engineer where specified.

Laboratory -- Shall mean any testing agency or testing firm which has been approved by the Department of Public Works.

Placer County Water Agency -- (PCWA) shall mean the agency that generally maintains and owns water facilities within the City of Rocklin.

South Placer Municipal Utility District -- (SPMUD) shall mean the agency that generally owns and maintains sewer conveyance facilities within the City of Rocklin.

Standard Construction Specifications -- Shall mean the latest standard construction specifications adopted by the City Council governing the construction of roads, streets, storm drainage, concrete structures, traffic signals, street lighting and other facilities within the City of Rocklin to provide for proper development.

Standard Drawings -- Shall mean the standard drawings as set forth herein, approved by the Director with his signature thereon, and as modified, revised, or added.

State -- As used in the State Specifications, shall mean City of Rocklin.

State Standard Plans -- Shall mean the Standard Plans of the State of California, Department of Transportation (Latest Edition).

Urban Area -- Shall mean the area within the boundary as defined by the Federal Highway Administration.

SECTION 2

GENERAL REQUIREMENTS

2-1 PLANS BY AN APPROPRIATE ENGINEER -- All plans and specifications for improvements, private and public, which are to be accepted for maintenance by the City and private onsite drainage and grading shall be prepared by a Consulting Engineer of the appropriate branch of engineering covering the work submitted.

2-2 APPROVED PLANS -- Complete plans and specifications for all proposed streets, bikeways, grading, drainage facilities, street lighting, industrial developments, commercial developments, and subdivisions, including any necessary dedications, easements, and rights of entry, shall be submitted to the Department of Public Works for approval. This approval must be substantiated by the signature of the Director or his authorized representatives prior to the beginning of construction of any such improvements. The Director or his representative shall order any Contractor to cease work on any project if said Contractor does not have properly approved plans in his possession.

2-3 REFERENCE TO CITY SPECIFICATIONS AND STANDARDS -- The General Notes and Special Provisions of all plans shall include the following note:

> All construction and materials shall be in accordance with the latest edition of the City of Rocklin Standard Construction Specifications, Improvement Standards and Standard Drawings.

2-4 WORK IN CITY RIGHTS OF WAY, EASEMENTS AND WATERWAYS -- Possession of a complete set of City-approved engineered plans shall allow a contractor duly licensed by the State of California to perform work specified on the plans in City rights of way, easements and waterways. The contractor shall be bonded as required in the City of Rocklin Municipal Code.

In lieu of the above required plans, minor work within City rights of way, easements and waterways may be performed in accordance with the following:

A. Minor work within street rights of way and easements may be performed with an encroachment permit.

   Minor work generally consists of such items as widening or constructing sidewalks adjacent to the existing roadside curb and gutter, constructing driveways in existing curb and gutter, constructing asphalt concrete driveways, installing driveway culverts, utility related work, and work which requires cutting the road surface.

   The encroachment permit shall be issued in accordance with Division 2, Chapter 5.5 of the Streets and Highways Code of the State of California.

B. Work within street rights of way and easements consisting of street light installations or street light installations and minor work described above may be performed with an encroachment plan.

2-5 IMPROVEMENT PLAN SUBMITTAL -- The initial submittal of improvement plans to the Department of Public Works shall consist of the following:

A. Four sets of plans, complete and in accordance with these Improvement Standards and the Standard Construction Specifications, along with any required specifications, computation, test data, and other material requested by the Director.

B. Two copies of the watershed map and drainage calculations in accordance with Section 5.

C. An Environmental Certificate from the City's Planning Department.

D. An itemized cost estimate. The improvements to be included on the estimate are as follows:

1. All public facilities, excluding trunk drainage defined in Section 5. (Public facilities include all improvements within the street right of way and public improvements outside of the right of way which are to be maintained by the City.)

2. All onsite underground storm drainage systems.

3. Earth excavation quantities.

4. Retaining and sound walls.

E. 50% of the plan check fee in accordance with Section 2-7.

F. The name, address and telephone number of the developer.

G. Utility letters in accordance with Section 2-16.

H. Two copies of the soils report.Should there be required alterations or revisions to the plans as submitted, the Director will return one copy with the corrections marked or indicated thereon. If the plans submitted are not prepared in accordance with these Improvement Standards and the Standard Construction Specifications or not in keeping with the standards of the profession, the Director may return them unmarked and unapproved.

2-6 IMPROVEMENT PLAN RESUBMITTAL -- Plans being submitted shall consist of three complete sets of plans, except that plans which involve trunk drainage, as defined by Section 5, shall consist of four sets. Additional sets may be required by the Director.

Plans being resubmitted that contain revisions or alternations other than those required by the Director on previously corrected plans shall require the Consulting engineer to bring those revisions or alternations to the attention of the Director.

2-7 PLAN CHECK AND INSPECTION FEE -- When improvement plans are initially submitted to the Department of Public Works for checking, 50% of the total plan check fee for the development will be required as a deposit to initiate checking of the plans.

Should the development not be carried to completion, any portion of the required deposit over and above the accumulated costs expended by the Department on the development will be refunded to the developer.

The Department of Public Works shall be notified of any change of billing address.

2-8 PLAN APPROVAL -- No plans will be approved nor construction authorized until such time as the Director signifies his approval by his signature on the set of plans and not unless such changes, corrections or additions are resubmitted to the Director for approval as previously prescribed for the original plans. At such time as the Consulting Engineer preparing the plans has made the necessary revisions and paid the remainder of the total plan check and inspection fee, as provided under the provisions of the City Code, and amendments thereto, has been paid, the Director will sign the tracings in the space provided, after the Consulting Engineer has signed them. The Director's approval is valid for a period of 12 months. Should work not commence within the 12 month period, the plans shall be resubmitted for reapproval.

2-9 FINAL PLANS REQUIRED -- The Consulting Engineer shall deliver the following number of sets of prints from the approved tracings to the Director:

A. Subdivisions - Five complete sets of plans.

B. Other Developments -- Five complete sets of plans.

One additional set of plans shall be delivered when trunk drainage facilities are shown on the plans. Additional copies of improvement plans may be requested by the Director at his discretion, and these shall be furnished to the City without cost.

Copies of the final utility letters required by Section 2-16 shall be included with the approved plans delivered to the Director.

A CD containing all plans in electronic format will also be submitted.

2-10 IMPROVEMENT PLAN REVISIONS DURING CONSTRUCTION -- Should changes become necessary during construction, the Consulting Engineer shall first obtain the consent of the Director and shall then resubmit the title sheet and the plan sheets affected for approval. The changes on the plans shall be made in the following manner:

A. The original proposal shall not be eradicated from the plans but shall be lined out. All sheets originally signed by the director shall remain a part of the plan set.

B. In the event that eradicating the original proposal is necessary to maintain clarity of the plans, approval must first be obtained from the Director.

C. The changes shall be clearly shown on the plans with the changes and approval noted on a revision signature block, conforming to the Standard Drawings.

D. The changes shall be identified by the revision number on a triangle delineated on the plans adjacent to the change and on the revision signature block.

E. An hourly fee will be charged to process all revisions.

Minor changes which do not affect the basic design or contract may be made upon the authorization of the Director, but said changes must be shown on "as-built" plans when the contract is completed.

The Director may order changes in the plans in order to complete the necessary facilities. Changes in the plans ordered by the Director shall conform to all of the above.

2-11 AS-BUILT PLANS -- The Consulting Engineer shall keep an accurate record of all approved deviations from the plans and shall provide three sets of bluelines and one reproducible copy of these records to the Director upon completion of the work before final approval of the completed subdivision improvements. These are to be utilized with the Inspector's plans for preparing a complete and accurate set of "as-built" plans for the permanent records of the City. The standard record drawing block will be used and the block will be stamped and signed by the construction engineer on each sheet of the plan set at time of preparation.

Certification by the Consulting Engineer of the finished pad elevations of subdivision lots shall be required prior to final approval of the subdivision improvements. Certification shall be in accordance with Section 9-8. See City Standard Drawing 1-10.

2-12 CONFLICTS, ERRORS AND OMISSIONS -- Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to any California State Law, City of Rocklin Municipal Code or Resolution, conditions of approval, or generally accepted good engineering practice, in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked in the Department of Public Works' review of the plans.

2-13 CHANGE IN CONSULTING ENGINEER -- If the developer elects to have a registered civil engineer or licensed land surveyor other than the engineer who prepared the plans provide the construction staking, he shall provide the Director in writing the name of the individual or firm one week prior to the staking of the project for construction. The Developer shall then be responsible for providing all professional engineering services which may be required during construction, the preparation of revised plans for construction changes, and the preparation of "as-built" plans upon completion of the construction.

In the Developer's notification of a change in the firm providing construction staking, he shall acknowledge that he accepts responsibility for design changes and "as-built" information as noted above.

2-14 SPMUD AND PCWA SUBMITTALS -- The Consulting Engineer shall submit to SPMUD and PCWA for approval and signature on improvement plans of sanitary sewer and water plans, respectfully, for improvements which are within the City of Rocklin prior to the City Engineer's signature on the improvement plans. Both City of Rocklin and Agency approval is required for such plans.

2-15 TUNNEL SAFETY REQUIREMENTS -- Any boring or jacking operation of 100 foot or greater length and involving an opening greater than 30 inches in diameter is subject to the State of California Division of Industrial Safety's tunnel safety requirements. The Consulting Engineer shall submit to the Division of Industrial Safety plans and specifications applicable to the tunnel operation, with a letter requesting tunnel classification. This procedure is also recommended to avoid project delay if there is the possibility of any personnel entering the tunnel, regardless of diameter and length. The letter should identify the Public Works agency responsible for the project, and the agency's mailing address. The plans shall identify underground utilities and tanks or areas for storing fuel and toxic gases in the vicinity of the tunnel site. The request for classification should be submitted allowing ample time for the Division of Industrial Safety review in order that any special requirements can be included in the project plans and specifications. The Consulting Engineer shall also attend the required preconstruction meeting.

2-16 EXISTING UTILITIES -- All existing utilities are to be shown on the plans. In addition, the Consulting Engineer shall submit prints of the preliminary and approved plans to the utility companies involved. This is necessary for the utilities to properly plan their relocation projects and needed additional facilities. Copies of the transmittal letters to the utility companies shall be provided to the Director. The transmittal letters shall indicate all utility pole conflicts which require relocation. The conflict shall be referenced to stationing and distance from centerline. In addition, the following note shall appear on the first page of the plans: No pavement work will occur within the road right of way prior to completion of utility pole relocation.

2-17 PARTIAL PLANS -- Where the improvement plans submitted over only a portion of ultimate development, the plans submitted shall be accompanied by the approved tentative plan or a study plan if there is no approved tentative plan showing topographic features of the ultimate development at an adequate scale to clearly show the proposed improvements.

2-18 OTHER AGENCY NOTIFICATIONS -- The Contractor is responsible for obtaining the approval and necessary permits of governmental or municipal agencies when their facilities are involved.

2-19 INSPECTION REQUIREMENTS -- Any improvement constructed to the Standard Construction Specifications for which it is intended that the City will assume maintenance responsibility, shall be inspected during construction by the Director. Each phase of construction shall be inspected and approved prior to proceeding to subsequent phases.

Private onsite grading and drainage shall be inspected during construction by the Director.

Any improvements constructed without inspection as provided above or constructed contrary to the order or instructions of the Director will be deemed as not complying with Standard Construction Specifications and will not be accepted by City of Rocklin for maintenance purposes.

The Consulting Engineer shall notify the Director when the Contractor first calls for grades and staking and shall provide the Director with a copy of all cut sheets.

Within 10 days after receiving the request for final inspection, the Director shall inspect the work. The Contractor, Consulting Engineer, and Developer will be notified in writing as to any particular defects or deficiencies to be remedied. The Contractor shall proceed to correct any such defects or deficiencies at the earliest possible date. At such time as the work has been completed, a second inspection shall be made by the Director to determine if the previously mentioned defects have been repaired, altered, and completed in accordance with the plans. At such time as the Director approves the work and accepts the work for City of Rocklin, the Contractor, Consulting Engineer and Developer will be notified in writing as to the date of final approval and acceptance.

On assessment districts and projects where City of Rocklin participates in the costs thereof, quantities will be measure in the presence of the Director, Consulting Engineer, and Contractor, and witnessed accordingly.

2-20 SPECIAL NOTICES AND PERMITS -- The Consulting Engineer shall be responsible for advising the Contractor to give the following notices and have in his possession the following permits and plans:

A. Contractor shall be in receipt of City approved plans prior to construction.

B. Contractor shall notify all utility companies involved in the development prior to beginning of work.

C. Contractor shall notify "Underground Service alert" (phone 800-642-2444) 48 hours in advance before any digging.

D. Contractor shall be responsible for the protection of all existing monuments and/or other survey monuments and shall notify City of Rocklin Department of Public Works of any damaged or removed City, State or Bureau monuments.

E. Contractor shall notify Department of Public Works upon application for permit and payment of required fees.

F. The Contractor shall verify all street names and their correct spelling with the Fire Department and Department of Public Works before ordering street signs.

G. Contractor shall be responsible for conducting his operation entirely outside of any floodplain boundaries. Floodplain boundaries shall be clearly delineated in the field prior to construction.

H. Contractor shall be responsible for conducting his operation entirely outside of any no grading area. These areas shall be clearly delineated in the field prior to construction.

I. Where work is being done in an offsite easement the Contractor shall notify the property owner 48 hours prior to commencing work.

SECTION 3

PLAN SHEET REQUIREMENTS

3-1 PAPER DETAILS -- All improvement plans shall be prepared on plan and profile sheets 24 in. x 36 in., F.A.S. sheets, Plate "A" plan and profile paper, or special consulting engineer's sheets which have been accepted by the City. Scales: Horizontal 1 in. = 20 ft, 40 ft, or 50 ft; Vertical 1 in. = 2 ft, 4 ft, or 5 ft, but only the scale, horizontal or vertical, for which the sheet was intended shall be used.

3-2 DRAFTING STANDARDS -- Plans approved by the City may be microfilmed. Therefore, certain drafting standards have become necessary to produce legible film and subsequent prints. All line work must be clear, sharp and heavy. Letters and numerals must be 1/8 in. minimum height, well formed and sharp. Numerals showing profile elevations shall not be bisected by station grid lines. Dimension lines shall be terminated by sharp solid arrowheads.

3-3 TITLE SHEET -- On subdivision or improvement plans exceeding three sheets in a set, a title sheet shall be prepared showing the following:

* A. The entire subdivision or parcel and project
B. Assessment district limits
C. City limits
D. Street names and widths
E. Section lines, grant lines and corners
F. Adjacent subdivisions, including names, lot lines and lot numbers
G. Property lines
H. Public easements
* I. Location map
J. Scale of drawings
* K. Index of sheets
L. Legend of symbols
* M. Signature block conforming to Standard Drawing 1-1 and situated at the lower right hand corner of the sheet
N. AC, AB, ASB quantities

Improvement plans consisting of three or less sheets and encroachment plans shall not be required to provide a title sheet but shall be required to show all of the above in the plans.

*Shall be shown on the front sheet of encroachment plans and plans consisting of three or less sheets.

3-4 TITLE BLOCK -- Each sheet within the set of drawings shall have an approved title block showing the sheet title, number, date, scale, and the Consulting Engineer's name, signature and license number; City of Rocklin, and the name of the subdivision or assessment district. Samples may be obtained from the Engineering Division.

The preferred location is across the right hand end of the sheets. This will facilitate the common method of plan storage by allowing the plan information to be viewed with the plans rolled up.

3-5 DRAINAGE, SEWER, WATER AND GRADING LAYOUT -- On all plans, the storm drainage, sanitary sewer and domestic water systems shall be shown on an overall plan layout. In addition, the storm drainage and sanitary sewer systems shall be shown on the street plans. Separate grading plans will be required for all subdivisions. On all other plans, an overall plan layout will not be required but the above facilities shall be shown within the development and on the street plans.

3-6 PLAN DETAILS -- In addition to the other requirements of these Improvement Standards, the following details shall be shown on plans submitted for approval. This does not in any way exempt the Consulting Engineer preparing plans from the responsibility of preparing neat, accurate and comprehensive plans in keeping with the standards of the profession.

A. Right of Way -- Right of way lines, the boundaries of lots fronting on the street, drainage easements, utility easements, planting easements, section lines and corners, land grant lines and temporary construction easements, both existing and proposed, shall be shown on the plans. All right of way and easement lines shall be properly dimensioned.

B. Topography -- All pertinent topographic features shall be shown, such as street lines, medians, driveways (on both sides of the street when within 40 ft of the median ending), curbs sidewalks, shoulders, location and size of storm and sanitary sewer lines, high water and frequent inundation levels, water lines, gas lines, telephone conduits, other underground utilities, existing structures, houses, trees (9 in. and larger) and other foliage, traffic signals, street lights and pullboxes, underground electrical conduits, walls, masonry structures, and all other features of the area which may affect the design requirements for the area. When a potential utility conflict exists, "as-built" elevations of the utilities shall be verified by the Consulting Engineer.

C. Contours and Elevations -- Existing contours or supporting elevations shall be shown on all plans submitted for subdivision, commercial improvements, or planned unit developments.

D. Profiles -- The plans shall show the existing profile of all roadway centerline, edges of pavement, curb and gutter flow lines, drainage ditches, storm and sanitary sewers. All profiles of proposed improvements shall state centerline elevations at 50 ft intervals and rate of grades, vertical curves and other vertical alignment data. When curb and gutters are designed for reconstructed City roads, elevations shall be shown at the edge of the outside travelled way, or if the road has a full paved section, shall also be shown 2 ft from the proposed lip of gutter. Any warped surface and vertical curve shall set elevations at 25 ft intervals.

The plans shall show the existing ground profile for a minimum distance of 200 ft beyond temporary street endings to facilitate setting proper vertical alignment

within the proposed improvement limits. The 200 ft minimum shall be increased when requested by the Director.

E. Stationing and Orientation -- The stationing on plan and profile shall read from left of right. Stationing shall increase from south to north or from west to east. Plans shall be so arranged that the north arrow points toward the top or upper 180 degrees, insofar as practical.

F. Bench Marks -- The bench marks and datum shall be clearly delineated on the plans both as to location, description and elevations. The datum shall be 1929 North American Datum (U.S.G.S. or U.S.C. and G.S.). Consulting Engineers shall contact the City for location and elevation of the nearest official City bench mark.

G. California Coordinate System -- The Director may require that the proposed improvements be tied into the California Coordinate System if monumented coordinate points are available within a reasonable distance (200 ft or less) of said improvement as determined by the Director.

H. Typical Sections -- A typical section for each type of facility within the improvement, setting out the structural features, shall be a part of the plans.

I. Cross Sections -- Cross sections shall be included in the plans, where determined necessary by the Director. When, in limited areas, unusual topographic features or special conditions occur that would affect the work, individual cross sections may be shown on the pertinent plan sheet.

J. Special Notes -- Special notes shall be clearly indicated, and it shall be conspicuously noted on the plans that all construction work and installations shall conform to the City of Rocklin Standard Construction Specifications and that all work is subject to the approval of the Director. Notes shall contain a statement regarding obtaining encroachment permits from other agencies when applicable.

3-7 REQUIRED NOTES -- A list of City required General Notes shown in the Standard Drawings 1-2 through 1-9 shall be attached to the original tracings for all development plans submitted to the City for approval.

SECTION 4

STREETS **4-1 STREET TYPES** -- The standard approved street types for City of Rocklin are as follows: (Refer to the Standard Drawings 3-1 through 3-7).

A. Alley -- A street depressed in the center of a right of way and surface width of 20 feet. An alley will be accepted by City of Rocklin as a public alley only when it is constructed of 6 in. thick portland cement concrete or 2 in. AC over 6 in. AB in accordance with Standard Drawing 3-21 and with the specific approval of the Director.

B. 42 Foot Street -- A cul-de-sac residential street with a right of way width of 42 ft, a back to back of curb width of 34 ft, and 4 ft sidewalks. See Standard Drawing 3-1.

C. 46 Foot Street -- A minor residential street with a right of way width of 46 ft and back to back of curb width of 38 ft and 4 ft sidewalks. See Standard Drawing 3-1.

D. 50 Foot Street - A residential collector street with a right of way width of 50 ft, a back to back of curb width of 42 ft, and 4 ft sidewalks. See Standard Drawing 3-2.

E. 60 Foot Street -- A residential collector with bike lanes with a right of way width of 60 ft, a back to back of curb width of 52 ft, and 4 ft sidewalks. See Standard Drawing 3-2.

F. 60 Foot Street -- An Industrial/Commercial street with a right of way width of 60 ft, a back to back of curb width of 48 ft, and 6 ft sidewalks. See Standard Drawing 3-3.

60 foot streets are required in commercial and industrial developments and are normally used in the vicinity of parks, schools and other public facilities.

G. 62 Foot Street -- A collector approach street with a right of way width of 62 ft, a back to back of curb width of 54 ft, and 4 ft sidewalks. See Standard Drawing 3-3.

62 ft streets shall be used as approach streets providing access onto 80, 90 ft and 120 ft streets. The 62 ft street approach shall be provided for a distance of 180 ft from the cross street right of way line with a 40 ft taper. See Standard Drawing 3-11.

H. 66 Foot Street -- A collector approach street with a right of way width of 66 ft, a back to back of curb width of 54 ft, and 6 ft sidewalks. See Standard Drawing 3-3.

66 ft streets shall be used as approach streets providing access onto 80, 90 ft and 120 ft streets. The 66 ft street approach shall be provided for a distance of 180 ft from the cross street right of way line with a 40 ft taper. See Standard Drawing 3-11.

I. 80 Foot Street -- A minor arterial street with a right of way width of 80 ft, a back to back of curb width of 68 ft, and 6 ft sidewalks. See Standard Drawing 3-4.

J. 90 Foot Street -- A minor arterial street with a right of way width of 90 ft, a back to back of curb width of 78 ft and 6 ft sidewalks. See Standard Drawing 3-4.

K. 120 Foot Street -- A primary arterial street with a right of way width of 120 ft, a back to back of curb width of 104 ft, and 6 ft sidewalks. See Standard Drawing 3-5.

L. Partial Street -- A street for which the full right of way cannot be dedicated or the complete street cannot be constructed. Partial streets shall be in accordance with Section 4-5.

4-2 STREET CLASS -- The standard approved street classes of City of Rocklin are as follows:

Class "A" Streets -- Class "A" street improvements shall be in accordance with Standard Drawings 3-1 through 3-5 and shall consist of the following:

1. "Asphalt" concrete pavement over an aggregate base, and aggregate sub-base as required.

2. Concrete curb and gutter and sidewalks.

3. Side slopes not steeper than 1½:1 in cuts or 2:1 in fills, or a reinforced concrete retaining wall beginning at the right-of-way line.

Semi-Rural. Semi Rural streets require special approval by City Council. Improvements shall be in accordance with Standard Drawing 3-6 and shall consist of the following:

1. Asphalt concrete pavement over an aggregate base.

2. Intersection widening at 80, 90 and 120 ft streets shall be in accordance with Standard Drawing 3-11.

4-3 STRUCTURAL SECTIONS -- The following standards for the design of structural sections for proposed improvements shall govern the preparation of plans for such improvements.

All of the following street sections shall include reinforcing fabric prior to the placement of aggregate base.

A. The minimum allowable thickness of roadbed section shall be as follows:

1. 2 in. asphalt concrete and 6 in. aggregate base on 42 ft streets.

2. 3 in. asphalt concrete and 6 in. aggregate base on 46 and 50 ft streets.

3. 3 in. asphalt concrete and 8 in. aggregate base on 60, 62, to 66 ft streets.

4. 4 in. asphalt concrete, 6 in. aggregate base and 8 in. aggregate sub-base on 80, 90 ft and 120 ft streets.

5. The structural section for industrial/commercial streets shall be 3 in. asphalt concrete and 8 in. aggregate base unless otherwise specified by the Director.

6. Class "A" streets, including the shoulders, shall have 2 in. asphalt concrete, 6 in. aggregate base structural section.

7. In transition areas from one street width to another street width, the heavier structural section shall be used in the transition area.

8. As an alternative to the preceding structural sections, total asphaltic concrete structural sections may be specified to be following minimum thicknesses:

   a. 5 1/2 in. of asphaltic concrete equals 2 in. of asphaltic concrete and 6 in. of aggregate base.

   b. 6 in. of asphaltic concrete equals 3 in. of asphaltic concrete and 6 in. of aggregate base.

   c. 9 in. of asphaltic concrete equals 3 in. of asphaltic concrete, 6 in. of aggregate base and 6 in. of aggregate subbase.

   Total asphaltic concrete sections must receive the specific approval of the Director.

B. In those areas considered by the Director as being critical soil condition areas, it will be required that the pavement be designed on the basis of the resistance R-value as determined in accordance with the State of California, Department of Transportation, California Bearing Ratio, or other approved method.

The thickness of the various structural components will be determined by the tables, charts, formulas and procedures contained in the State Design Manual, or as directed by the Director. Under no circumstances shall the Director approve a structural section design that is less than those specified in this section.

Traffic index shall be determined by the Developer's Engineer for each project, and approved by the Director.

4-4 PROFILE STANDARDS -- The following standards for the design of profiles for proposed improvements shall govern the preparation of plans for such improvements (see Section 3).

A. The minimum grade on new streets shall be 0.35% except that the minimum curb and gutter grade around intersection corner roundings shall be 0.50%. Curb and gutter elevations on crest and sag vertical curves shall be adjusted to meet the 0.35% minimum grade.

B. Standard cross slope on new streets shall be 2.0%.

C. The minimum cross slope on widening shall be 1.5% and the maximum cross slope shall be 3.0%. The cross slope of the widening shall favor the cross slope of the existing pavement whenever possible.

D. When two streets intersect, neither street shall have a grade greater than 3.0% for a minimum distance of 40 ft measured from the curb line of the intersecting street, except in unusually rough terrain, as determined by the Director. The centerline of the lesser intersecting street shall meet the crown slope at the projected lip of the gutter. Crown slope may be reduced to 1.0% within the intersection, if necessary.

The minimum vertical curve length allowable at the intersection of two grades shall be 50 ft. Vertical curves on residential and collector street may be omitted where the algebraic difference in grades does not exceed 2.0%. The minimum vertical curve data to be computed and shown on the plans shall consist of the point of intersection elevation, the tangent gradients, the middle ordinate and the length of curve.

F. The design speed and minimum stopping sight distance over any segment of roadway shall be as follows unless specific approval for a lesser design speed is received from the Director:

Street Type	Recommended Design Speed	Minimum Stopping Sight Distance
42 ft R/W	25 MPH	150 ft
46 ft R/W	25 MPH	150 ft
50 ft R/W	30 MPH	200 ft
60 ft R/W	35 MPH	250 ft
62 ft R/W	35 MPH	250 ft
66 ft R/W	35 MPH	250 ft
80 ft R/W	40 MPH	300 ft
90 ft R/W	45 MPH	360 ft
120 ft R/W	50 MPH	430 ft

4-5 PARTIAL STREETS -- Partial streets may be permitted by the Director along the boundary of a subdivision or property of the developer where the full right of way cannot be dedicated or where the complete street cannot be constructed.

Partial streets shall be constructed to a complete geometric and structural section for a minimum paving width specified by the following:

A. One half ultimate right of way width plus 10 ft.

B. When paving partial construction of an ultimate street development, the edges of the current pavement are to be protected by use of 2 in. x 6 in. approved headers, construction grade, or by placing a minimum of 1 ft additional width of aggregate base material beyond the edge of pavement to the grade and depth of the adjacent structural section.

4-6 OFFSET INTERSECTION -- Streets intersecting any given street from opposite sides shall have their centerlines meet, or the offset between intersections shall be a minimum of 120 ft for residential streets and at least 150 ft for all other streets.

4-7 CUL-DE-SAC -- Cul-de-sac streets shall be terminated with a bulb which shall have a right of way and back of curb radius dimensions conforming to the Standard Drawing 3-7 and the following:

Approach Street	R/W Radius	Back of Curb Radius
42 ft street	42 ft	38 ft
46 ft street	46 ft	42 ft
50 ft street	50 ft	46 ft
60 ft street	60 ft	56 ft

No cul-de-sac shall exceed 600 ft in length.

"Not a Through Street" sign shall be placed at the following locations, at the C.R. or closest property line.

a. At the entrance of a cul-de-sac when the cul-de-sac is at the prolongation of either street, drive, or way.

b. At the entrance of a cul-de-sac when the cul-de-sac has a curve linear alignment and obstructed terminus, regardless of length.

4-8 ELBOW INTERSECTION -- Right angle elbow intersections shall be designed in accordance with the Standard Drawing 3-8.

4-9 CENTERLINE RADII -- The curve data (delta angle, length, tangent and radius) for all centerline curves shall be computed and shown on the plans.

The minimum radius curve for 42 ft streets shall be 200 ft.

The minimum radius curve to 46 and 50 ft streets shall be 350 ft with the exception that 50 ft streets exceeding 1,000 ft in length and serving as collectors connecting to 80, 90 ft or 120 ft streets shall have a minimum radius curve of 500 ft.

The minimum radius curve for 60, 62 and 66 ft streets shall be 500 ft.

The minimum radius curve for 80, 90 ft and 120 ft streets shall be 1,000 ft.

Special consideration will be given to unusually difficult alignment problems.

4-10 SIGHT DISTANCE AT INTERSECTIONS -- Streets shall not be designed with intersections on the inside of curves or at any locations in general where sight distance will be inadequate for drivers to tell if they can safely enter the traffic flow or cross the street. Exceptions may be made by the Director for especially difficult design circumstances. In lieu of visibility easements, additional street right of way may be dedicated. Minimum intersection design sight distances standards shall be as follows:

MINIMUM SIGHT DISTANCE

Type Street Being Entered	Recommended Design Speed (MPH)	Minimum Sight Distance*
42 ft R/W46 ft R/W50 ft	25 MPH	200 ft
R/W60 ft R/W62 ft R/W	25 MPH	200 ft
66 ft R/W	30 MPH	200 ft
80 ft R/W	35 MPH	250 ft
90 ft R/W	35 MPH	300 ft
120 ft R/W	35 MPH	350 ft
	40 MPH	400 ft
	45 MPH	500 ft
	50 MPH	500 ft

* Distance measured from an entering driver's eye position to the position of the closest approaching vehicle's far front corner.

The entering driver's eye position shall be assumed 3 ft to the right of the entering street's centerline and 11 ft clear of the nearest vehicle lane on the street being entered.

The position of the closest approaching vehicle's far front corner shall be assumed 3 ft from the edge of the nearest approaching vehicle lane for each direction of travel.

The Standard Drawings 3-12 through 3-14 show details of the areas which must be controlled for adequate intersection sight distance on 80, 90 ft and 120 ft streets. Other street types and alignments require individual designs based on the minimum sight distance standards given above.

Visibility easements or additional street right of way shall describe an area to be maintained clear of any and all obstructions to a clear view from the adjacent streets. No sign, hedge, structure, natural growth, fence, or other obstruction of any kind whatsoever to a clear view, higher than 2 ft 6 in. above the nearest pavement surface (or travelled area where no pavement exists) shall be installed or maintained or shall be permitted to be installed or maintained within the easement area.

Additional visibility requirements not subject to the above shall conform to Standard Drawing 3-14.

4-11 RIGHT OF WAY RADII -- Minimum right of way radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

Street Type	R/W Radius
42 ft46 ft50 ft	20 ft
	20 ft
	20 ft

4-12 RIGHT OF WAY WIDTHS -- Right of way widths shall be in accordance with these standards for the type of street under consideration, and the Standard Drawings 3-1 through 3-7, or as required by the Director.
In no instance, without specific approval of the Director, shall a street have a right of way width which is less than that of the street for which it is a continuation.

Right of way widths at 80, 90 ft and 120 ft street intersections shall be in accordance with the Standard Drawings 3-4 and 3-5 as applicable or as required by the Director.

Right of way widths on a 60 ft street at intersections where the right of way width or the continuation of the street beyond the intersection increases and at intersections that have unusually high traffic volumes shall be widened to a 62 or 66 ft right of way in accordance with the Standard Drawing 3-3 and as determined by the Director.

4-13 BUS TURNOUTS -- Bus stop turnouts shall be required at the intersection of two 80 or 90 ft streets, an 80 or 90 ft and a 120 ft street, and two 120 ft streets in accordance with Standard Drawing 3-10.

Bus turnouts shall be required on 80 or 90 ft and 120 ft streets at collector street intersections which have or will need traffic signals as determined by the Director.

Bus stop turnouts may also be at other locations as determined by the Director.

Sidewalks shall be 8 ft wide at bus turnouts as shown on the Standard Drawing 3-10.

4-14 INTERSECTION WIDENING -- Pavement widening at intersections shall be in accordance with the following:

A. Pavement widening shall be required at the intersection of two 80 or 90 ft streets, an 80 or 90 ft and a 120 ft street, and two 120 ft streets in accordance with Standard Drawing 3-11.

B. Pavement widths on 60 and 62 ft streets at intersections where the right-of-way width on the continuation of the street beyond the intersection increases and at intersections that have unusually high traffic volumes shall be widened to a 66 or 68 ft street.

C. Pavement widening on 60 ft streets and 62 ft streets intersecting with 80 or 90 ft and 120 ft streets shall be required in accordance with Standard Drawing 3-11.

D. Pavement widening shall be required at all intersections of Class "A" streets with 80 or 90 ft and 120 ft streets in accordance with Standard Drawing 3-11.

4-15 PARTIAL PAVEMENT WIDENING -- Partial pavement widening shall be terminated in accordance with the following:

A. Partial pavement widening shall be terminated with the end of the pavement perpendicular to the street unless modified below. A 2 in. x 6 in. redwood header board shall be required at the pavement ending.

B. Partial pavement widenings that terminate adjacent to an intersection or driveway shall be tapered 45° to the street if right of way is available.

C. Partial pavement widenings that terminate a travelled lane shall be tapered 1 ft per 1 ft of pavement offset per 5 MPH increment of design speed. The design speed used in determining the taper shall be that given in the table in Section 4-4(F).

D. Pavement tapers for the termination of partial street widening different from the above may be required by the Director.

4-16 PAVEMENT CORNER RADII -- The minimum edge of pavement radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

CLASS "A" STREETS

Street Type	E.P. (C&G Lip) Radius
50 ft*50 ftAll others	27 ft32 ft32 ft (4 ft sidewalks)34 ft (6 ft sidewalks)

- Intersects with a wider street.
- When two streets of different widths intersect, the radius for the narrower street shall apply, except that when a 50 ft street intersects a wider street, the radius for the wider street shall apply.

PARTIAL STREETS

All intersection pavement edges on partial streets shall have a minimum radius of 13 ft.

4-17 DEVELOPER'S PAVEMENT, SIGNAL, AND STREET LIGHT RESPONSIBILITY --

The developer shall be responsible for the following:

A. Where the existing pavement section does not generally meet the current standard and/or the centerline grade and alignment are not satisfactory to the Director, the Developer shall be responsible for the pavement section to the centerline on all streets within, adjacent, and contiguous to his project.

The Developer shall overlay any areas beyond the centerline where the design centerline grade deviates from the existing. The Developer shall also be responsible for overlaying any low areas where the new pavement meets the existing pavement to maintain a uniform cross slope.

The City will pay for any pavement necessary where the full structural section is replaced beyond the centerline if the Director elects to adjust the grade and/or alignment of the existing street.

B. When making a connection to an existing street end, the Developer shall be responsible for removing and reconstructing up to a maximum of 20 ft of the existing roadway to make a satisfactory connection as required by the Director.

C. The Developer shall be responsible for all of the structural section and pavement on all new streets within, adjacent, and contiguous to his project. If the street is to be paved under a future City contract, the Director may require a bond or cash deposit for the roadway and related work and include the work in the City contract.

D. All temporary approaches to the existing roadway required as a result of the development shall be at the Developer's expense. The temporary approaches shall be paved with the structural section to be determined individually for each situation.

E. The Developer shall be responsible for relocating existing traffic signals and street lights as necessary for new street and driveway locations.

F. The Developer shall be responsible for constructing curbed median islands when required by the Director if the street is to be paved under a future City contractor, the Director may require a bond or cash deposit for the roadway and related work and include the work in the City contract.

G. The Developer shall be responsible for bus turnouts as shown on the Standard Drawings 3-10 and 3-11 and in accordance with Section 4-13 of these Standards.

H. The Developer shall be responsible for all drainage facilities (bridges, pipes, culverts, and appurtenances) crossing new streets within, adjacent, and contiguous to the project. Section 4-19 states developer responsibility and City participation in drainage facilities on existing improved streets.

4-18 CITY COST PARTICIPATION -- With the submittal of improvement plans for checking, the Engineer shall include an application for City cooperation in the proposed work if City participation is proposed for the improvement. This application shall show the items of work and the estimated quantities.

The City will notify the Consulting Engineer by letter as to the acceptance and the extent of cooperation.

The Consulting Engineer is to submit the City proposal to the Developer for his approval prior to the final approval of the improvement plans.

Should the Developer not approve the City proposal, time will be allowed for negotiation between the Developer and the City to arrive at a mutually acceptable price or a separate course of action prior to final approval of the improvement plans.

Any portion of work shown on the Consulting Engineer's plans, for which the City has agreed to cooperate, shall not be segregated by note or legend, but shall be included in the general contract. The City will reimburse the Developer for these cooperative items, after acceptance by the Director and final payment of plan check and inspection fees, if these fees were direct billed.

Final quantities will be determined by field measurement, observed jointly by the City Inspector, the Contractor, and the Developer; or his designated agent.

Unit prices prepared for fee and bond calculation and authorized by the City shall be used as a guideline for cooperative work. The Director may negotiate unit or lump sum prices for items not usually encountered, or for unusual field conditions.

4-19 REPLACING CULVERTS -- The City will cooperate in the replacement of highway cross culverts for the same length as the existing culvert as follows (see Section 4-18):

A. The entire cost for inflowing cross culverts to the property under development that must be replaced.

B. The entire cost for outflowing cross culverts if the existing culvert is of unsatisfactory size and has unsatisfactory grade.

C. If the existing outflowing cross culvert is to satisfactory grade but unsatisfactory size, the City will pay for the cost of the pipe only.

D. If the existing outflowing cross culvert is of satisfactory size, the City will not participate in the cost to replace the culvert.

E. Major trunk and collector drainage facilities being constructed by agreement with the City will be replaced for the entire right of way width in acceptance with the foregoing and in conformance to these Improvement Standards.

4-20 TRENCHING IN EXISTING PAVED ROADWAYS -- Crossings other than perpendicular crossings of existing roadways and all trenching in high traffic locations shall provide for select backfill material and increased structural section depth over the standard for that particular roadway.

4-21 TESTING OF MATERIAL -- Testing of materials to be utilized in work performed under the Standard Construction Specifications shall be performed in accordance with the methods of the Laboratory of the State of California, Department of Transportation. Signed copies of the test results, as required, shall be submitted to the Director. Test results shall show clearly the name of the individual and firm performing the tests, as well as the name of the project, the date of sampling, and the date of testing.

The tests indicated in the Standard Construction Specifications will be the minimum required. In large developments or those developments presenting special problems, a more comprehensive and extensive testing program may be required. Such conditions will be evaluated and an appropriate testing program prescribed on an individual basis. Two copies of any Federal Housing Administration required soils tests shall be submitted with proposed plans.

4-22 STREET NAMES -- All roads and streets within an improvement shall be named by the owner or subdivider subject to the approval of the Director and the Fire Department. No duplication of names already in use or previously proposed will be permitted. Sound-alike names or names with more than 13 spaces are not acceptable.

Street name signs shall be furnished and erected by the Contractor. Street name signs shall conform to requirements of the Standard Construction Specifications and these Improvement Standards.

Street names and street name sign locations shall appear on plans submitted for approval. Sign details shall be as shown on the Standard Drawing 3-28.

4-23 STREET SIGN LOCATIONS -- Street sign locations shall conform to the following:

A. Two street name sign installations (with four sign plates on each post) are required at each intersection where on or both of the intersecting streets has a right of way width of 80 ft or greater. At a four-way intersection, the installations shall be located on both far right-hand corners of the intersection relative to the street having the greater right of way width or relative to the more important street if right of way widths are equal.

   At a "Tee" intersection, the first installation shall be located on the far right-hand corner of the intersection, relative to the through street, and the second installation shall be located adjacent to the through street at a point in line with the centerline of the terminating street. One sign plate should be omitted from the standard four-plate installation at the "Tee" intersection sign locations where an approach street does not exist.

B. One street name sign installation (with four sign plates on each post) is required at each intersection where both intersecting streets have a right of way width of less than 80 ft. At a four-way intersection, the installation shall be located on one of the far right-hand corners of the intersection relative to the street having the greater right of way width or relative to the more important street if the right of way widths are equal. At a "Tee" intersection, the installation shall be located on the far right-hand corner relative to the through street.

C. For highways with frontage roads, the street name sign installations shall be located in the divider strip between the frontage road and the main travelled lanes of the highway. All other requirements shall be as outlined above, except that only one sign will be required (in the divider strip in line with the centerline of the minor street) when there is no opening in the divider strip for access to the main highway.

D. The Standard Drawings show placement details for street name signs. On streets having a right of way width of 80 ft or greater, the street name sign installations are to be located adjacent to the more important street, at the end of the curb return. On streets with right of way widths less than 80 ft, the street name sign installations are to be located at the midpoint of the curb return.

E. Street name signs shall be placed on street light poles wherever possible, in accordance with the Standard Drawings 3-29 and 3-30.

4-24 TRAFFIC SIGNS -- All cul-de-sac and dead-end (stub) streets serving more than twelve residences shall be posted with a standard code W53 (Not A Through Street) sign. The sign post shall be 4 in. x 4 in. S4S treated douglas fir (State of California, Spec. No. 56-2.02B). The bottom of the sign shall be a minimum of 7 ft above the sidewalk. The standard location for the W53 sign is on the right-hand side at the tangent point of the corner rounding, 6 in. (minimum) from the back of sidewalk.

4-25 PERMANENT BARRICADES -- Where improvements are temporarily terminated on a street proposed to be extended in the future, the improvements shall include a permanent type barricade at the end of the street extending completely across the right of way to serve as a warning to the public. The barricade shall be constructed, erected, painted, and signed in accordance with the Standard Drawing 3-25. When necessary, barricades may be lengthened by making the 2 in. x 12 in. plank continuous with splicing at the posts.

Gates may be required where streets stub into public park areas or like areas.

Timber barricades with W-31 signs in accordance with the Standard Drawing 3-25 shall be required where partial street widening terminates at the far end of the widening in the direction of traffic.

Sidewalk barricades shall be constructed at the end of sidewalks where pedestrians cannot safely continue beyond the end of the sidewalk. Sidewalk barricades shall conform to the Standard Drawing 3-26.

4-26 TREES -- All trees removed from within the ultimate right of way shall be replaced with trees from the approved list. Trees shall not be planted any closer than 6 ft from the back of sidewalks adjacent to City streets. Where 4 ft minimum planters are required adjacent to the sidewalks, they may be widened to accommodate the planting of trees. Approved trees for planting in City rights of way and public easements are listed as follows (desired trees not listed may be planted with the approval of the Director):

DECIDUOUS TREES

BOTANICAL NAME	COMMON NAME
Acer platanoides	Norway Maple
Aesculus carnea "Briotii"	Red Horse-Chestnut
Betula verrucosa	European White Birch
Crataegus phaenopyrum	Washington Thorn
Gleditsia triacanthos inermis:	Thornless Honey Locust
"Sunburst" Moraine	
"Imperial" Shademaster	
Koelreuteria paniculata	Goldenrain Tree
Lagerstroemia indica	Crape Myrtle
Liquidamber styraciflua:	Sweet Gum
"Palo Alto"	
"Festival"	
"Burgundy"	
Liriodendron tulipifera	Tulip Tree
Pistacia chinensis	Chinese Pistache
Platanus acerifolia	London Plane Tree
Prunus:	Flowering Plums and Cherries
Cerasifera "Thundercloud"	
"Krauter-Vesuvius", "Atripurpurea"	Cherry Plum Variety
Tilia cordata	Littleleaf Linden

BROAD-LEAVED EVERGREEN TREES

BOTANICAL NAME	COMMON NAME
Ceratonia siliqua	Carob Tree
Cinnamomum camphora	Camphor Tree
Laurus nobilis	Grecian Laurel
Magnolia grandiflora	Southern Magnolia
Quercus agrifolia	California Coast Live Oak
Ulmus parvifolia	Chinese Elm
E.Sideroxylon	Eucalyptus tree

CONIFERS

BOTANICAL NAME	COMMON NAME
Ginkgo biloba:	Maidenhair Tree
"Autumn Gold"	
"Fairmont"	

Permission to remove any tree in City right of way or easements shall be obtained from the Director in advance.

See Sections 3-6(B), and 9-7 for additional requirements regarding trees.

4-27 DRIVEWAYS -- Driveways shall be in accordance with the following:

A. The maximum driveway slope shall be 10% except in unusual terrain conditions and specifically approved by the Director.

B. No driveway will be allowed within 5 ft of a side property line on a commercial development. Exceptions may be approved by the Director for joint driveways or in unusual cases.

C. The minimum width for a single family residential and duplex driveway shall be 18 ft. Residential driveways with plus grades shall have a rise of no more than 8 in. above the back of sidewalk grade at a point 7 ft from the back of sidewalk. Maximum driveway width shall be 35 ft.

D. All commercial and multiple family developments shall install driveways in accordance with the Standard Drawing 3-23. The standard multiple family and commercial driveway width shall be 45 ft on 120 ft, 90 and 80 ft, street and 35 ft on streets less than 66 ft in width. Lesser widths for development on 60 ft and 50 ft streets may be approved by the Director. Minimum driveway widths shall be 25 ft.

E. The standard driveway for industrial developments shall be as shown on the Standard Drawings 3-19 and 3-23.

F. When driveways are abandoned or relocated, the driveway sections must be removed and replaced with standard curb and gutter, sidewalk and planters.

G. When street frontage improvements are existing with Type 1, Type 1A, or Type 2 curb and gutter, driveways shall be installed per Standard Drawing 3-19.

H. Driveways entering levee roads and driveways entering commercial property on all roads shall have a slope not exceeding 5% for a minimum distance of 20 ft, measured from the edge of existing pavement. Driveways normally used by vehicles towing house or boat trailers shall have special requirements to be determined on an individual basis by the Director.

I. The nearest edge of driveways shall not be closer than 40 ft to the end of traffic medians. Medians shall be reconstructed and/or lengthened to conform to this section if necessary.

J. Visibility requirements shall be in accordance with the Standard Drawing 3-14.

K. Driveway Pads

1. That driveway pads less than 30 ft long shall be constructed of concrete.

2. That driveway pads which exceed 30 ft and are less than 100 ft may be constructed with asphalt concrete.

3. That those driveway pads greater than 100 ft in length, which might be in more rural or undeveloped areas should be allowed to maintain an all weather surface, such as chip seal on asphalt, excepting the first 10 ft will be concrete or asphalt concrete abutting the city street.

4-28 PEDESTRIAN LANES -- Pedestrian lanes within a development shall be constructed with a minimum of 6 (six) in. of portland cement concrete, Class 'B", for the full width of the easement.

The maximum grade for pedestrian lanes shall be 12%.

Pedestrian lanes, where situated between lots, shall be fenced with chain link fencing from the street right of way to the back lot line. These fences shall be 6 ft high from the building setback line to the back lot line and 36 in. high from the building setback line to the street right of way line.

Cross fencing to control access shall be placed at the street ends of all pedestrian lanes in accordance with the Standard Drawing 3-27.

All pedestrian lanes shall have lighting installed in accordance with Section 8-6(C).

4-29 HANDICAP RAMPS -- Ramps for handicapped pedestrians shall be constructed at all street intersections in accordance with the Standard Drawing 3-16 and at other locations where required by the Director.

4-30 CURB AND GUTTER -- Curb and gutter shall be installed adjacent to all developments in accordance with the Standard Drawing 3-15 and the following:

A. Type 1 curb and gutter: 42, 46 and 50 ft streets in residential developments.

B. Type 1A curb and gutter: All developments not included in A, C or D, or as required by the Director.

C. Type 2 curb and gutter or type or type 6 gutter: Industrial subdivisions.

D. Type 2 curb and gutter: Frontage roads; parks; unfenced schools; open space areas; public facilities; 60, 66, 80, 90 and 120 ft streets with commercial and multi-family (not duplex) developments.

4-31 BARRIER CURB -- Barrier curbs shall be in accordance with these standards and the Standard Drawing 3-15.

Barrier curbs shall be required at all locations where parking will be allowed in the front yard. Lawns may extend to the back of sidewalk in lieu of planters. See Standard Drawing 3-17 for planter and barrier curb details.

4-32 SIDEWALKS -- Sidewalks shall be in accordance with these standards and Standard Drawing 3-15.

Where utility poles and other obstructions are situated within streetside sidewalks, a minimum of 4 ft of clear uninterrupted sidewalk area shall be provided. Where it is necessary to widen the sidewalk beyond its standard width to attain the 4 ft clearance, the widened area shall extend a minimum of 5 ft beyond each side of the obstruction and a 10 ft taper on each side of the widening shall be required.

All school bus turnouts shall have 8 ft sidewalks along all frontages except fenced play areas where no access is provided, as determined by the Director.

Where sidewalks end in fill areas, the fill shall be extended beyond the end of the sidewalk for a minimum distance of 5 ft. As an alternate, a cut-off wall may be constructed at the end of the sidewalk.

All sidewalks adjacent to commercial developments shall be 6 ft wide.

Sidewalks shall be 8 ft wide at bus turnouts as shown on the Standard Drawing 3-10.

4-33 FENCES -- The normal location for fences or walls along public streets is at the right of way line, on the private property side or at the edge of the visibility easement required by Section 4-10.

All fences and walls are subject to the visibility requirements of these standards. See Standard Drawing 3-14.

On backup lots adjacent to 80, 90 and 120 ft streets, fences or walls shall be placed at the back of sidewalk or outside of and at the edge of the visibility control area shown on Standard Drawings 3-12 and 3-13.

Fences and walls may require modification to accommodate street light poles and/or foundations.

All fences along schools shall be set back a minimum of 8 ft from the back of curb, regardless of sidewalk width. The area between the sidewalk and fence shall not **exceed 10% cross slope.**

4-34 PRIVATELY OWNED BRIDGES -- Bridges intended for the sole use of the occupants of a multifamily type development or any bridge on a private road shall be designed to withstand an H-20 load, unless specifically approved by the Director for a lesser loading. Other design features of the bridge, including but not limited to widths, railings,

clearances and materials shall be in conformance with City and State Standards. A soils report prepared by a qualified soils engineer will be required. Design calculations signed by the consulting Engineer and including the registration number shall be required.

4-35 RESIDENTIAL STREET NAME SIGN -- See Standard Drawing 3-28

1. The sign shall consist of two (2) single faced blades per street name.

2. The sign shall be on an 8 in. wide blade made of .080 gage aluminum with 1/2 in. radius corners.

3. The lettering and numbering shall be white Scotch Lite Reflective No. 2290 heat activated or No. 3290 pressure sensitive on a green background.

4. All letters and numbers over 2 in. in height shall have radius corners inside and outside.

5. The green color is 3M or equal high intesity sheeting (SS87).

6. The "City of Rocklin" shall be in 1 in. letters centered across the top of the blade.

7. The "street name" shall be in 4 in. letters.

8. The suffix of the street name (Way, Ave., St., Ct., etc.) shall be in 2 in. letters at the top of the end of the name.

9. The length of the blades which will be together on one post shall be the same. EXAMPLE: If one street name sign were to require a blade 12 in. long and the other street name at the intersection were to only require and 8 in. long blade, both street names would be placed on 12 in. blades.

4-36 MAJOR STREET INTERSECTIONS..STREET NAME SIGNS -- Major street intersection street name signs shall be installed at four locations of the intersections. The signs shall be attached at lower mast arm of the traffic signal light using standard manufactured clamp brackets.

Sign panels shall be aluminum, 18 in. high, and have green reflectorized sheeting on both sides. Letters shall be series C, 6 in. upper case and 4 1/2 in. lower case and white reflectorized (high intensity) street names shall be on one side of each panel.

Streets with different names on the same intersection. The plate shall show the name on both streets on one panel with directional arrow on the plate.

When no signal or mast arms are available, major streets name signs shall comply with Section 4-35.

4-37 "NOT A THROUGH STREET" SIGN -- "Not a through Street" sign shall conform to City of Rocklin Legislative Policy No. 9 and as follows:

A. Cul-de-sac:

1. Install at the entrance of a cul-de-sac when the cul-de-sac is at the prolongation of either street, drive, or way, at the C.R. or closest property line.

2. Install at the entrance of a cul-de-sac when the cul-de-sac has a curvilinear alignment and obstructed terminus, regardless of length.

3. Install at the entrance of cul-de-sac when the length of the cul-de-sac exceeds 600 ft.

B. Non Cul-de-sac

1. Install at the C.R. or closest property line at the beginning of all of the streets, drives, ways, and arterials that have dead ends where the vehicular crossing is restricted by a physical barrier either permanent or temporary.

C. Responsibility

1. Determination

Director of Public Works/City Engineer shall be responsible in determining and making a finding when and where this sign will be warranted as per this policy.

2. Installation (New Developments)

Developer shall be responsible for the installation of this sign for all new developments as determined and recommended by the Director of Public Works.

3. Installation (Existing Developments)

In existing areas, when the finding is made that a sign is required, the installation and maintenance shall be the responsibility of the City of Rocklin Public Works Department.

SECTION 5

DRAINAGE

5-1 DRAINAGE CLASSIFICATION -- Drainage systems shall be classified as follows:

A. Lateral -- Drainage conduits receiving drainage from areas of less than 30 acres shall be called a lateral system.

B. Trunk -- Drainage conduits receiving drainage from areas of 30 acres or more shall be called a trunk system.

C. Onsite Drainage -- Drainage facilities required to carry storm runoff within the development, excluding trunk drainage conduits, facilities draining public streets, and facilities draining concentrated flow from other properties.

5-2 DRAINAGE CAPACITY DESIGN -- Special provisions must be made within the drainage system to insure that the inlet invert elevations and the capacity of the drainage system will accommodate the ultimate development of the watershed. This shall include the entire upstream watershed, regardless of the existing conditions and shall conform to the Placer County Storm Water Management Manual(PCSWMM).

5-3 DRAINAGE ALIGNMENT DESIGN -- The diversion of natural drainage will be allowed only within the limits of the proposed improvement. All natural drainage must enter and leave the improved area at its original horizontal and vertical alignment unless an agreement, approved by the Director, has been executed with the adjoining property owners. See (PCSWMM).

5-4 DRAINAGE PROFILES -- A plan and profile shall be shown for all drainage systems which carry natural drainage that originates upstream of the limits of the development. Onsite drainage may be shown in plan view only, unless requested by the Director. See Section 5-12 for extending profiles offsite.

5-5 PIPE RADII CRITERIA -- All pipe placed on curves shall meet manufacturer's recommendations for curved alignment. All curves, radii, length of pipe joints, and types of pipe shall be shown on the plans.

5-6 PIPELINE ALIGNMENT REQUIREMENTS -- Drainage pipelines shall be located in the street whenever possible. The location of storm drainage pipelines in new streets shall be 6 ft north or west of and parallel with centerline of the street. All new pipes and channels shall be placed a minimum of 100 ft from existing and proposed water wells. Meandering and unnecessary angular changes of pipelines shall be avoided. Angular changes when necessary shall not exceed 90°.

All pipes shall be constructed with a minimum cover of 2 ft over the top of pipe unless other utilities or grade conditions prohibit. In no case shall minimum pipe cover be less than specified on the Standard Drawings 5-1 and 5-2.

5-8 DRAINAGE EASEMENTS -- Drainage easement requirements are as follows:

A. All drainage facilities shall be located in one of the following:

1. Public street or alley

2. Public utility easement, specifically dedicated to include drainage facilities

3. Private or dedicated drainage easement

Drainage easements shall also be required for any drainage water discharging onto offsite private property where that drainage water does not discharge into a continuous pipeline or watercourse. Dedication of easements shall be completed and submitted to the Director for approval.

B. Closed Conduits -- Easements for closed conduits shall meet the following requirements:

1. Minimum width of 10 ft with the centerline of the pipe at quarter point; pipe may reverse sides at angle points.

2. Provide access and working space rights.

3. For pipes exceeding 24 inches in diameter or trenches exceeding 5 ft in depth, the easement shall have additional width to provide ample working space as required by the Director.

C. Open Channels -- Easements for open channels shall have sufficient width to contain the open channel with side slopes, fencing where required, and one 15 ft service road when required by the Director. Suitable ramps must be provided for access to the bottom when bottom is used for maintenance. See Standard Drawing 4-29.

5-9 HYDRAULIC DESIGN CRITERIA --

A. Pipe Criteria -- Pipe criteria shall be as follows:

1. Minimum pipe diameter allowable on any storm drain shall be 12 in. except for onsite drainage where the minimum size shall be 8 in. or as approved by the Director.

2. Driveway culverts shall be approved by the City for size, grade, alignment and type and shall be shown on improvement plans. See Standard Drawing 3-20. Contractor shall contact City for encroachment permits. Driveway culverts for residential property shall not exceed length necessary for 24 ft maximum driveway width, and for commercial and industrial shall not exceed length necessary for 45 ft maximum driveway width.

3. Minimum velocity in closed conduits shall be 2 1/2 fps when flowing full.

4. The profile for closed conduits shall include upstream and downstream profile for a distance of 500 ft or until and average profile is established.

B. Cross Culvert Criteria -- The design of cross culverts shall be as follows:

1. Cross culvert size shall be determined on the basis of runoff as specified in Placer County Storm Water Management Manual.

2. Cross culvert profile will be determined by an examination of the overall profile of the channel for a minimum distance of 500 ft each side of the installation.

C. Open Channels -- Open channels shall consist of concrete lined channels, asphalt concrete lined bottom channels, grouted cobble lined bottom channels or natural earth channels.

Criteria for open channels shall be as follows:

1. Minimum and maximum velocities for open channels shall conform to the Placer County Storm Water Management Manual.

2. Freeboard requirements shall conform to the Placer County Storm Water Management Manual.

D. Design Computation -- The design computation for drainage shall include the following information which shall be submitted before the plans will be accepted for checking.

1. Watershed map.

2. Drainage area in acres.

3. C.F.S. in each pipe or channel reach.

4. Invert elevations of each pipe or channel reach.

5. Top of structure elevation or top of channel lining elevation.

6. Hydraulic grade line elevation.

7. Hydraulic gradient.

8. Pipe, size, class, length and gradient. Items 6 and 7 are not required when design is based on hydraulic grade line inside conduit.

9. Channel dimensions and water surface profile computations.

E. Hydraulic Grade Line -- Hydraulic grade line shall be a minimum of 0.50 ft below the elevation of inlet grates and manhole covers of all structures of the upstream system.

Hydraulic grade line shall be shown on the pipe systems when the hydraulic grade line is above the top of the pipe.

5-10 DRAINAGE STRUCTURES -- Drainage structure criteria shall be as follows:

A. Closed Conduits -- The requirements for closed conduits are as follows:

1. Closed conduits shall be either cast-in-place concrete pipe, precast reinforced concrete pipe, non-reinforced concrete pipe, vitrified clay pipe, corrugated steel pipe, or spiral ribbed steel pipe, HDPE or PVC as defined in the Standard Construction Specifications with exception of HDPE which shall conform to State Specifications.

2. The specific type of pipe or alternate pipes to be used in the development shall be shown on the plans.

3. Cover requirements are shown on the Standard Drawings 5-1 and 5-2. At locations where the minimum cover requirements cannot feasibly be obtained, the conduit will be either encased in concrete or provided with a concrete cover or other method of pipe protection as specified by the Director.

B. Manholes -- Requirements for manholes are as follows:

1. Standard precast concrete or saddle type manholes shall be used where required. When cases arise where special manholes or junction boxes are required, the design must be approved by the Director. In no case will junction boxes or manholes be allowed which are smaller than 24 in. inside dimensions.

2. Manholes shall be located at junction points, angle points greater than 15°, changes in gradient, and changes in conduit size.

3. Spacing of manholes, or junction boxes of such size as to be enterable for maintenance shall not exceed 400 ft for drains 24 in. and smaller in diameter and 600 ft for pipes greater than 24 inches in diameter, except under special approved conditions. The spacing of manholes shall be nearly equal whenever possible.

4. All manholes and junction boxes other than inlets shall have standard manhole covers as shown in the Standard Drawing. Manholes will not be allowed in the gutter flow line.

5. A reinforced concrete top as shown on the Standard Drawing 4-11 shall be required when any pipe would enter the manhole above the base of a manhole cone.

6. Slotted manhole covers may be used to pick up minor drainage in non-traffic areas, including onsite drainage on residential lots.

7. Sand and oil trap manholes shall be provided onsite prior to connection with public drainage system or prior to the final point of discharge.

    a. STORMCEPTOR® INSTALLATION

        1. Concrete Stormceptor® Installation
        The installation of the concrete Stormceptor® should conform in General to state highway, provincial or local specifications for the Construction of manholes. Selected sections of a general specification that are applicable are summarized in the following Sections.
        2. Excavation
        Excavation for the installation of the Stormceptor® should conform to state highway, provincial or local specifications. Topsoil that is removed during the excavation for the Stormceptor® should be stockpiled in designated areas and should not be mixed with subsoil or other materials. Topsoil stockpiles and the general site preparation for the installation of the Stormceptor® should conform to state highway, provincial or local specifications.

The Stormceptor® should not be installed on frozen ground. Excavation should extend a minimum of 300mm (12") from the precast concrete surfaces plus an allowance for shoring and bracing where required. If the bottom of the excavation provides an unsuitable foundation additional excavation may be required.

In areas with a high water table, continuous dewatering should be provided to ensure that the excavation is stable and free of water.

3. Backfilling
   Backfill material should conform to state highway, provincial or local specifications. Backfill material should be placed in uniform layers not exceeding 300mm (12") in depth and compacted to state highway, provincial or local specifications.

4. Drop Pipe and Riser Pipe
   Once the by-pass section has been attached to the lower treatment chamber, the inlet down pipe, and outlet riser pipe must be attached. Pipe installation instructions and required materials are provided with the insert.

5. Inlet and Outlet Pipes
   Inlet and outlet pipes should be securely set into the by-pass chamber using grout or approved pipe seals so that the structure is watertight. Kor-N-Seal® boots are normally used and installed at the precast concrete plant prior to shipping. The Kor-N-Seal® boots are applicable for pipes with an outside diameter up to 1150mm (45"). The appropriate Stormceptor® affiliate should be notified if the pipe is to be grouted in the field at the time of ordering (i.e. Kor-N-Seal® boots will not be used).

   Installation of the Kor-N-Seal® boots should follow the manufacturer's recommendations. As previously mentioned, the boots will already be attached to the Stormceptor® at the concrete plant. Accordingly, the following procedure should be followed to attach the inlet and outlet pipes at the Stormceptor®

   1. Center the pipe in the boot opening.
   2. Lubricate the outside of the pipe and/or inside of the boot if the pipe outside diameter is the same as the inside diameter of the boot
   3. Position the pipe clamp in the groove of the boot with the screw at the top
   4. Tighten the pipe clamp screw to 60 inch pounds

5. On minimum outside diameter installations lift the boot such that it contacts the bottom of the pipe while tightening the pipe clamp to ensure even contraction of the rubber
6. Move the pipe horizontally and/or vertically to bring it to grade.

6. Frame and Cover Installation
Stormceptor® provides a standard cast iron frame and cover with the name Stormceptor® clearly embossed on it. Precast concrete adjustment units should be installed to set the frame and cover at the required elevation. The adjustment units should be laid in a full bed of mortar with successive units being joined using sealant recommended by the manufacturer. Frames for the cover should be set in a full bed of mortar at the elevation specified.

7. Site Inspector
Hanson Concrete Pipe & Products, Inc. has a dedicated inspector to review all Ontario Canada Stormceptor® installations. Since January 1, 1999, the inspector works with contractors to ensure that all the Stormceptor® components are installed properly as per our recommendations. In addition, the inspector would then prepare and mail a certificate to the owner to assure that the Stormceptor® unit was properly installed.

b. VORTECHNICS STORMWATER PRODUCTS INSTALLATION

Installation

1. Each Stormwater Treatment System shall be constructed according to the sizes shown on the Drawings and as specified herein. Install at elevations and locations shown on the Drawings or as otherwise directed by the Engineer.

2. Place the precast base unit on a granular subbase of minimum thickness of six inches (152mm) after compaction or of greater thickness and compaction if specified elsewhere. The granular subbase shall be checked for level prior to setting and the precast base sectioin of the trap shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5% the base section shall be removed and the granular subbase material re-leveled.

3. Prior to setting subsequent sections place bitumen sealant in Conformance with ASTM C 990 along the construction joint in the section that is already in place.

4. After setting the base and wall or riser sections, prepare to install

The chamber. Place the ¾-inch thick by ¾-inch wide butyl mastic seal vertically on the outside of the swirl chamber starting one inch above the bottom of the swirl chamber and continuing to a height equal to the elevation of the bottom of the upper aperture of the swirl chamber. The butyl mastic seal should abut the downstream side of the pre-drilled mounting holes that attach the swirl chamber to the long walls of the concrete vault. Next, install the extruded EPDM seal on the bottom edge of the 180 degree downstream section of the swirl chamber by first applying a bead of Sikaflex-1a polyurethane elastomeric sealant into the extruded slot then slide the seal onto the swirl chamber. The extruded seal should extend 3-inches upstream of the mounting holes, toward the inlet end of the vault. Set the swirl chamber into position and keep the seal approximately ½-inch above the floor of the concrete vault. Apply a continous bead of Sikaflex-1a sealant under the cupped bottom of the seal. Set and anchor the circular swirl chamber by bolting the swirl chamber to the side walls of the concrete vault at the three (3) tangent points and at the inlet tab using HILTI brand stainless steel drop-in wedge anchors or equivalent 3/8-inch diameter by 2-3/4 inch minimum length at heights of approximately three inches (3") off the floor and at fifteen inch (15") intervals to approximately the same height of the butyl mastic sealant (at locations of pre-drilled holes in aluminum components). Apply a continous bead of Sikaflex-1a sealant to the intersection of the inside bottom edge of the extruded seal and the vault floor.

5. Prior to setting the precast roof section, bitumen sealant equal to ASTM C 990 shall be placed along the top of the baffle wall, using more than one layer of mastic if necessary, to a thickness at least 1-inch (25mm) greater than the nominal gap between the top of the baffle and the roof section. The nominal gap shall be determined either by field measurement or the shop drawings. After placement of the roof section has compressed the butyl mastic sealant in the gap, finish sealing the gap with an approved non-shrink grout on both sides of the gap using the butyl mastic as a backing material to which to apply the grout. Also apply non-shrink grout or Sikaflex-1a to the joints at the side edges of the baffle walls.

6. After setting the precast roof section of the stormwater treatment system, set precast concrete manhole riser sections, to the height required to bring the cast iron manhole covers to grade, so that the sections are vertical and in true alignment with a ¼-inch (6mm) maximum tolerance allowed. Backfill in a careful manner, bringing the fill up in 6-inch (152mm) lifts on all sides. If leaks appear, clean the inside joints and caulk with lead wool to the

satisfaction of the Engineer. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of Stormwater Treatment Systems shall conform to ASTM specification C 891 “Standard Practice for Installation of Underground Precast Utility Structures”.

7. Holes made in the concrete sections for handling or other purposes shall be plugged with a nonshrink grout or by using grout in combination with concrete plugs.

8. Where holes must be cut in the precast sections to accommodate pipes, do all cutting before setting the sections in place to prevent any subsequent jarring which may loosen the mortar joints. The Contractor shall make all pipe connections.

C. Inlets -- Requirements for inlets are as follows:

1. Inlets shall be placed so that the length of flow in the gutter does not exceed 500 ft. The depth of flow in the gutter at the inlet shall not exceed 0.35 ft, as determined by the charts on the Standard Drawings 4-9 and 4-10. The runoff flow used to check the depth shall include any flow that may bypass upstream grates. Special grates to prevent bypass may be required by the Director.

2. Inlets at sag points where bypass flow from upstream grates is possible shall be Type B. Type E inlets shall be used at all other sag points. The outfall pipe from the inlet shall be sized to accommodate the design runoff taking into consideration bypass flow from upstream inlets.

3. Type A, B, and C inlets shall be used on all arterial streets including commercial and industrial areas.

4. Type D and E inlets shall be used on all other streets not specified in item 3.

5. Type F inlets shall be used in unimproved medians, and may be used in roadside ditches away from driveway locations.

6. Drop inlets in streets shall be placed at lot lines in residential subdivisions, except at intersections where they shall be placed at the beginning or end of the curb return.

7. Nonstandard drop inlets for onsite drainage shall conform to the following: Inlets for onsite drainage as defined in Section 5-1C shall be 12 inches in the least dimension. The area of the opening "G" in square inches shall not be smaller than G-30A where "A" is the area in acres of the contributing watershed. The maximum area draining into one inlet shall be 2 acres.

All inlets for onsite use that are not shown in the Improvement Standards shall be clearly dimensioned on the plans. All grates shall be designed to provide adequate safety for automobile traffic, bicycles and pedestrians.

8. Type A or B inlets may be used as junction boxes. When used as junction boxes where pipe is changing directions, the inside dimension requirements for junction boxes shall be met. Inlets shall not be used as junction boxes in sag points.

9. Drop inlets draining public streets may be connected directly to a collector or trunk line 36 inches in diameter or larger by means of a lateral not exceeding 15 inches in diameter and 20 ft in length and having a slope not exceeding 30%. At sag points the drop inlets shall be connected to a manhole.

10. All drop inlets over 48" in overall height will be reinforced with #4 rebar at 8" O.C.

D. Junction Boxes -- The requirements for junction boxes are as follows:

1. Junction boxes shall be constructed of reinforced concrete or fabricated from reinforced concrete pipe sections where size limitations permit, except when standard inlets are used as junction boxes as specified in Section 5-10(C)8.

2. Minimum wall thickness for reinforced concrete junction boxes shall be 6 in.

3. The inside dimension of junction boxes shall be such as to provide a minimum of 3 in. clearance on the outside diameter of the largest pipe in each face. All junction boxes shall be rectangular in shape unless otherwise approved by the Director. Junction boxes deeper than 4 ft shall have a minimum dimension of 48 in.

E. Headwalls, Wingwalls, Endwalls, Trash Racks and Railings -- The requirements for these facilities are as follows:

1. All headwalls, wingwalls, and endwalls shall be considered individually and shall be, in general, designed in accordance with the Standards and Specifications of the California Department of Transportation.

2. Trash racks will be provided to prevent clogging of culverts and storm drains and eliminate hazards. The trash racks shall be designed in conformance to the design shown in the Standard Drawings 4-22 and 4-23. Temporary trash racks will be allowed where pipe will be extended in the near future.

3. On cross culvert drains, pre-formed end sections conforming to the Standard Drawing may be required by the Director.

4. Metal beam guard rail, chain link or wrought iron fencing may be required by the Director at culverts, headwalls and box culverts and on steep side slopes. When so required, the railing shall be installed in accordance with the Standard Construction Specifications.

F. Cross Culverts -- The requirements for cross culverts shall be as follows:

1. Cross culverts may be of reinforced concrete pipe or corrugated steel pipe meeting the requirements of the Standard Construction Specifications and the following criteria.

2. When specified by the Director, reinforced concrete box culverts or structural plate arch culverts shall be installed.

3. Crossings of major creeks may require special aesthetic considerations as determined by the Director.

4. Crossings of major creeks shall be designed for 100-year storm event and shall not raise the upstream water by more than 0.5 ft.

5-11 TEMPORARY DRAINAGE DIVERSIONS -- The requirements for temporary drainage diversions are as follows:

A. Temporary drainage diversions, such as dams and pipe plugs, shall be located and constructed in such a fashion as to permit their removal during adverse weather.

B. Locations and removal procedures for temporary drainage installations shall be approved by the Director, and these installations shall be removed when necessary to prevent damage to adjoining property.

5-12 CHANNELS AND OUTFALL DESIGN -- The design of channels and outfalls shall be as follows:

A. Open Channels -- Requirements for open channels are as follows:

1. Drainage may be conducted through an improvement in open channels under the following criteria and if approved by the Director.

a. The quantity of flow is such that it will exceed the capacity of a 72 in. pipe.

b. The outfall point is such an elevation that minimum cover cannot be obtained over the pipe.

2. All channels to be reconstructed shall be built to a typical cross section as approved by the Director.

   Fully lined and bottom lined channels shall have a minimum bottom width of 6 ft and shall have an access ramp for maintenance equipment.

3. For all channels, either realigned or natural, the following items shall be shown on improved plans in addition to information heretofore required.

   a. Typical sections and cross sections.

   b. Profile of the existing channel and top of bank profile for a minimum of 50 ft each side of the development in order to establish an average profile grade through the development.

B. Interceptor Ditches -- Interceptor ditches or approved alternates shall be placed at the top of the cut or bank where deemed necessary by the Director to prevent erosion of the channel bank.

C. Upstream and Downstream Profiles -- The requirements for these profiles are as follows:

1. All drainage outfalls shall be shown both in plan and profile on the improvement plans until a definite "daylight" condition is established.

   All drainage ditches upstream of the improvement shall be shown on the plans and profile until an average profile grade through the improvement is established.

   The profiles shall include ditch flowline and top of bank elevations.

2. When improvements have more than one unit, the drainage outfall shall be shown as extending to the property boundary, and beyond if required, although it may not be constructed with the current unit development. All temporary outfalls shall be shown both in plan and profile on the improvement plans.

SECTION 6

DOMESTIC WATER SUPPLY SYSTEM

6-1 INTRODUCTION -- Design of water facilities shall conform to the requirements set forth in the PCWA Improvement Standards Technical Provisions and Standard Drawings, "Latest Edition" and the following provisions.

6-2 WATER SUPPLY QUALITY -- The quality of the water shall conform to the Environmental Protection Agency Drinking Water Regulations.

6-3 WATER SUPPLY PRESSURE -- Normal operating pressures of not less than 35 psi nor more than 100 psi shall be maintained at service connections to the distribution system, except that during periods of peak domestic and fire demand, the pressure shall not be less than 20 psi.

6-4 REQUIRED FIRE FLOWS -- For areas of the general types noted below, the indicated fire flows are to be provided with the initial development. Expansion or change in zoning of the development shall be subject to requirements of the Insurance Services office.

A. Residential Area -- For residential areas having primarily one story single family dwellings, on average size lots, provide a minimum 1,000 gallons per minute.

B. Commercial, Planned Unit Developments, and Multiple Dwelling Areas including apartments and light commercial structures, provide minimum 2,000 gallons per minute.

C. Principal Business Districts, Industrial, and Other Individual High Value Buildings, Consult the Guide for Determination of Required Fire Flow of the Insurance Services Office.

6-5 DISTRIBUTION SYSTEM LAYOUT REQUIREMENTS -- The water system layout requirements are as follows:

A. Main Location -- All water mains shall be installed within public rights of way or easements.

1. The preferable location shall be 3 ft from the curb and gutter on the northerly or westerly side of the street. If it should be necessary because of existing improvements or possible conflict with other utilities, the mains shall be installed within an easement immediately adjacent to and behind the property line fronting on the public right of way.

2. If it is necessary to install a water main within a private road, the easement shall be the width of the paving plus 1 ft each side.

3. Ten feet shall be the minimum horizontal distance between parallel water and sanitary sewer lines and the water main shall be higher than the sewer. On crossings, the water line shall be at least 12 in. above the sewer line.

4. When crossing a sanitary sewer force main, it shall be specified that the water main be installed a minimum of 3 ft above the sewer line and be of cast iron, or ductile iron. The protection shall extend at least 5 ft on each side of the force main.

B. Valves, Hydrants, and Blow-offs -- The distribution system shall be equipped with a sufficient number of valves so that no single shut-down will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than 500 ft in school, commercial, industrial, or multiple family dwelling areas or greater than 800 ft in other districts. In no case shall more than two fire hydrants be removed from service. The valves shall be so located that any section of main can be shut down without going to more than three locations to close valves. Valves shall preferable be located at street intersections, 3 ft into the pavement from the curb and gutter where possible. If it is necessary to install valves between street intersections, they shall be located on property lines between lots. Fire hydrants and blow-off assemblies shall be located as follows:

1. Fire hydrants shall be of wet barrel type and shall be placed at street intersections wherever possible, and located to minimize the hazard of damage by traffic. They shall have a maximum normal spacing of 500 ft measured along the street frontage. Hydrants located at intersections shall be installed at the curb return. All others shall be located on property lines between lots.

2. Not more than two hydrants shall be placed on a 6 in. main between intersecting lines, and not more than three hydrants on an 8 in. main between intersecting lines. The minimum size main serving a fire hydrant shall be 6 inches in diameter. The pipeline connecting the hydrant and the main shall be 6 in., with a gate valve installed near the main.

SECTION 7

SANITARY SEWER DESIGN

Design of sewer facilities shall conform to the requirements set forth in the South Placer Municipal Utility District Standard Specifications and Improvement Standards "Latest Edition".

SECTION 8

STREET LIGHTS

8-1 STREET LIGHTS REQUIRED -- Street lights shall be required for all lots and parcels being developed or constructed upon. In addition, street lights may be required for lots and parcels containing existing structures which are being improved or altered, depending on the nature and extent of the work. Illustrations of street lights generally required are shown on the Standard Drawing 7-3. Street lights shall only be energized after City acceptance of the installation.

8-2 DEVELOPER'S RESPONSIBILITY -- Existing street lights which must be relocated or repositioned as a result of the construction of new streets or driveways into a development shall be the responsibility of the developer.

The developer shall make arrangements with P.G. & E. for service points. Service points shall be shown on the improvement plans. The developer shall be responsible for all costs associated therewith which shall be paid directly to P.G. & E. The contractor shall verify the street light service point location(s) with P.G. & E. prior to installation. The City will request energization from P.G. & E.

8-3 MAINTENANCE DISTRICT ANNEXATION REQUIREMENT -- All developments other than subdivisions which contain street light installations shall complete and submit to the Director an agreement petitioning the City Council to annex the property to the City of Rocklin Street Lighting Maintenance District. The City will provide Annexation Agreement forms, upon request.

8-4 GENERAL PLAN DETAILS -- The plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, and all applicable provisions and details specified in these standards. On subdivision plans, the street lights shall be shown on a separate sheet and shall be included in the improvement plans.

8-5 DESIGN STANDARDS -- Street lighting shall be designed in conformance with these standards, the current edition of the City of Rocklin Standard Construction Specifications, Pacific Gas and Electric, and the "American National Standard Practice for Roadway Lighting" of the American Standards Institute, except that the average horizontal maintained foot candles for the various street classifications shall be as shown in the Standard Drawing 7-5.

8-6 STREET LIGHT DESIGN DETAILS -- Design details for street lights are as follows:

A. Intersections -- All intersections shall conform to the Standard Drawing 7-4.

B. Cul-de-sacs Bulbs -- All cul-de-sacs exceeding 130 ft in length, measured from the street light location at the intersection to the right of way line at the end of the cul-de-sac, shall have a street light within the bulb. The location of the street light within the bulb shall conform to the Standard Drawing 7-6.

C. Pedestrian Lanes -- Street Lights shall be placed at both ends of pedestrian lanes.

D. Spacing -- Maximum street light spacing, measured along the street centerline, shall conform to the Standard Drawing 7-5.

E. Street Light Poles --

1. All street lights on thoroughfares, arterials, collector approach to arterials, and commercial/industrial roadways shall be type "A" and shall be either steel poles or exposed aggregate poles as approved by the Director.Steel poles shall be an Ameron Type PL288 Hot-Dipped Galvanized Steel Pole or an approved equal. Concrete poles shall be an Ameron Type MBR-9-123-AEC-8 with a graffiti resistant finish and a Pole Top Cap Type C-1 or an approved equal. The base cover shall be galvanized steel.

2. Street lights on all other roadways shall be type "B" exposed aggregate poles. The pole shall be an Ameron Type SBR-T-123 with a graffiti resistant finish or an approved equivalent. The base cover shall be galvanized steel.

3. The position of the street light poles shall conform to the Standard Drawing 7-2. Streetlight spacing shall be staggered and located at property lines when possible. Street light designs utilizing one side, median or opposite configurations shall be approved by the Director.

4. Street lights shall be numbered according to P.G. & E.'s sequential numbering system. Street Light numbers shall conform to the requirements of Standard Plan 7-19 to 7-22.

5. Streetlight pole heights shall conform to the requirements of Standard Plan 7-3. Alternate pole heights shall be approved by the Director.

6. Streetlight mast arm lengths shall conform to the requirements of Standard Plan 7-14. Alternate mast arm lengths shall be approved by the Director.

7. The concrete footing requirements shall conform to the requirements of Street Light Standard Plan 7-16.

8. The base leveling requirements shall conform to the requirements of Street Light Standard Plan 7-17.

F. Luminaries -- The type of street light and the appropriate wattage shall be specified on the plans. The luminaries shall be high-pressure sodium type with internal ballasts. All luminaries shall conform to the standards outlined in the Construction Specifications. High Pressure Sodium vapor lamps approved for use are listed in Table 1 below.

Table 1: High Pressure Sodium Vapor Lamps Approved for Use

			Manufacture		
Lamp Size Watts	ANSI Ballast Code	Average Initial Lumens	GE Co. Type Lucalux	Phillips Type Ceramalux	Sylvania Type Lumalux
100	S54	9,500	LU100	C100S54	LU100
150	S55	16,000	LU150/55	C150S55	SU150/55
200	S66	22,000	LU200	C200S66	LU200
250	S50	27,000	LU250	C250S50	LU250

2. The light pattern for reach luminaire shall be specified on the plans. The light pattern for each luminaire shall be obtained from the Standard Drawing 7-5 and Standard Drawing 7-13.

3. All street light systems utilizing streetlight lamps up to, and including 250 watts shall be designed for 120-volt service unless connecting to an existing system. The maximum allowable line voltage variation shall be ± 5%. Line voltage variation shall be shown on the plans.

4. Cobra Style Street lights – For luminaires 100 to 150 watts; the luminaire shall be an American Electric Series 113, General Electric Type M250R2, or an approved equal. For luminaires 200 to 250 watts, the luminaire shall be an American Electric Series 125, General Electric Type M400R2, or an approved equal.

5. Post Top Street lights – Luminaires shall be an American Electric 247 Series, General Electric T1R, or an approved equal.

6. A service pedestal shall be required for all improvements requiring three or more street lights. The service pedestal shall conform to the requirements of Standard Plan 7-7 or 7-8. The service pedestal shall open towards the street.

G. Service -- All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to or within the right of way and shall be open and easily accessible to the street frontage. Electrical service shall conform to the requirements of Standard Plans 7-11 and 7-12.

H. Pull boxes

1. Except as noted, a number 3 ½ or no. 5 concrete pull box shall meet the provisions of Section 86 of the most recent edition of the California Standard Specifications and Standard Plan. The pull box shall be installed within five feet of the base of all street light poles.

2. All pull boxes shall be installed per Street Light Standard Plan 7-9.

3. Pull boxes shall not be more than 250 feet apart on long runs.

4. Pull boxes shall not be placed where they will be subject to vehicular traffic or in curb ramps. Exceptions shall require approval of the Director.

4. Except as noted, all pull box covers shall be inscribed with "Street Lighting" and be secured with 3/8-inch bolts, capscrews, or studs, and nuts which meet the provisions of Section 86 of the most recent edition of the California Standard Specifications and Standard Plan.

I. Wiring -

1. The wiring for the electrolier shall conform to the requirements of Streetlight Standard Plan 7-10.

2. Except as noted, all wiring methods and equipment construction shall conform to the National Electric Code (N.E.C.) and applicable sections of the most recent edition of the California Standard Specifications.

3. All connections to PG&E facilities shall be made with an H type compression tap for street lighting made by Homac, Catalog # UB214, or PG&E Code 305926. Sealing of connections to PG&E facilities shall be made with Insulated Vinyl-Backed Mastic Sealant, PG&E Code 384159.

4. All field connections and splices shall comply with Section 86 of the most recent of the California Standard Specifications. Splices shall conform to the most recent edition of the California Standard Plans. Splices will only be permitted in grounded pull boxes or inside the light pole. All splices and terminal lugs shall be soldered by the hot iron, pouring or dipping method. Open flame soldering will not be permitted.

5. Unless authorized otherwise, all wiring shall be THW AWG. Copper only. For wire sizes #8 insulated and larger, wire shall be stranded copper. For wire sizes #10 and smaller, wire shall be solid copper. Unless otherwise specified, all wiring shall be of the following sizes.

a. All field wiring shall be #8 minimum.
b. Ground wire shall be #8 minimum solid.

c. All wire in pole: #10 minimum.
d. All wire to be connected to PG&E facilities shall be # Ø1 minimum.

6. Conductor and wiring schedule shall be shown on the plans.

J. Photoelectric Control – The photoelectric control shall be a Dark To Light (DTL) D120-1.0-S or an approved equal. All photoelectric controls shall be oriented to the north. For group controlled street lights, the photoelectric control shall be located on the pole closest to the service pedestal or in the service pedestal. All photoelectric controls shall conform to the following:

1. Photoelectric control must meet or exceed all requirements of ANSI C136.10-1996.
2. Line voltage operating range is 105 to 130 VAC at 60 Hz.
3. Load rating shall be 1,000 Watts tungsten 1800VA ballast.
4. Turn ON shall be 1.5 ±0.3 foot-candles at 120 VAC.
5. Turn OFF shall be 1.5 times the turn ON.
6. Photocontrol shall have a sealed cadmium sulfide light sensor.
7. Photocontrol shall have instantaneous turn ON and 3 to 5 second turn OFF delay.
8. Cover of photocontrol shall be constructed of UV resistant material. Impact resistance shall be greater than 1.0 foot-pounds from – 40° C to + 65° C.
9. Control shall be capable of withstanding a drop of 3 feet to a concrete floor without causing damage to the housing or changing the electrical operation.
10. Plug blades shall be brass which plug into an NEMA twist-lock receptacle integral with the luminaire.
11. Surge protection shall be a metal oxide varistor (MOV) of at least 160 joules wired line to neutral.
12. The following shall appear on the base: month and year of manufacture; individual serial numbers; complete model description; operating voltage range; load rating; and provision for marking installation and removal dates. Year of manufacture shall be permanently molded on cover.
13. Contact "chatter" on opening of contacts (turn OFF of Control) shall not exceed 5 milliseconds.

K. Conduit

1. All conduit to be used shall be a minimum of 1 1/2 inch diameter, schedule 40 PVC. Conduit shall have a 2-foot minimum cover from the top of conduit to the finished grade of the sidewalk, parkway, or roadway.

2. All steel conduit and other metal parts, including bonding bushing, shall be N.E.C. approved parts and shall be continuously bonded and grounded per N.E.C. requirements.

3. All bends and/or offsets shall be made with factory sections using approved couplers per N.E.C. requirements.

4. All empty conduits shall have a #10 green solid copper wire inside and sealed with a duct seal, approved by the Director, on both ends of the conduit.

5. The ends of all conduits installed in a service pedestal shall be sealed with a duct seal approved by the Director. Conduits stubbed for future extension shall be capped.

6. Prior to placement of conduit, a bed of clean sand, a minimum of 2-inches thick, shall be placed in the trench. A minimum of 4-inch thick layer of clean sand shall be placed over the conduit prior to backfill with additional material.

L. Prior to installation, the Contractor shall submit to the Inspector one copy of manufacturer's literature, and laboratory technical data for the following items:
1. Streetlight Poles
2. Luminaires
3. Mast Arms
4. Photoelectric control
5. Lamps

M. Telecommunication -
1. Telecommunication Conduit - Developer shall install telecommunication conduit within the Public Utility Easement of each street (Public or Private). The conduit shall be of 3" diameter PVC schedule 40 with continous #10 wire and shall include access to the cable.

2. Except as noted, the pull Box shall be a number 3½ or number 5 concrete pull box and shall conform to the requirements of the most recent edition of the California Standard.

3. Spacing - Pull boxes shall be 250 feet apart.

4. Pull box covers shall be inscribed with telecommunication cable and secured with 3/8" bolt or capscrews.

SECTION 9

GRADING

9-1 GENERAL REQUIREMENTS

Grading shall conform to the Uniform Building code, except as modified by these Improvement Standards.

9-2 PLAN SHEET DETAILS

In addition to the requirements of Section 3, the following items shall be included on grading plans:

A. Slope symbols for 3:1 slopes or steeper.

B. Ridge and/or valley delineation.

C. Typical lot grading details.

D. Proposed spot and/or pad elevations.

E. Flow directional arrows (offsite, around perimeter of development when adjacent to developed areas) and perimeter elevations at the property line.

F. Existing spot elevations and/or contour lines onsite and offsite around perimeter of development. Where the existing terrain is not relatively flat, contour lines shall be mandatory. The spot elevations or contour lines shall be extended offsite for a minimum distance of 50 ft (flat terrain--100 ft minimum) when adjacent to undeveloped areas.

G. Existing trees (variety, size and elevation at base of all trees 9 in. or larger.

H. Retaining wall details (symbols, construction details and limits).

I. Back of sidewalk elevations.

J. Storm drainage system.

K. Typical sections across side yard property lines where the difference in finish pad elevations exceeds 2 ft. Delineated on the section shall be the side yard drainage swale and the minimum distance between the proposed building and the side yard property line.

L. Names of adjacent subdivisions.

M. Offsite intersecting property lines.

N. Signature block for certification of pad elevations by Consulting Engineer (subdivisions only).

O. For all export projects:

Location of spoiled disposal area as specified below:

1. Spoil slopes to be 3:1 or flatter.
2. Finish spoil heights to be less than 3 ft.
3. No spoil within 5 ft of property lines.
4. Spoil shall not block drainage patterns.
5. Spoil shall be levelled prior to acceptance of project.

9-3 **ROLLING TERRAIN GRADING** -- Grading of rolling terrain shall be accomplished in a manner whereby the effect of the rolling terrain is maintained as close to that which exists as practically possible. Every effort shall be exerted to keep grading of rolling terrain to an absolute minimum.

9-4 **BOUNDARY GRADING** -- Special attention shall be given to grading adjacent to the exterior perimeter property line of a development. All adverse effects to offsite properties adjacent to new developments shall be reduced to an absolute minimum. Fills and cuts adjacent to the exterior perimeter property line shall be designed in accordance with the following:

A. Fills -- Fills in excess of 1 ft shall not be allowed without adequate justification and approval by the Director.

When fills are unavoidable, they shall conform to the Standard Drawing 2-1 and shall be constructed in the following manner.

1. If possible, fill slopes shall be constructed offsite, with the property line being situated at the top of the fill.

2. A right of entry shall be required for all offsite fills. The following note shall be placed on the plans: Right of Entry obtained from (name) on (date).

3. In lieu of offsite slopes, retaining walls, 5:1 slopes or flatter, or combinations thereof may be utilized onsite.

B. Cuts -- Cuts shall be constructed in accordance with the Standard Drawing 2-2, except that the slope setback from the property line to the slope hinge point shall be a minimum of 2 ft for all slopes steeper than 5:1.

C. Fences -- When fences are required, they shall be placed within 1.0 ft of the property line. The height of a fence shall be measured from the highest ground adjacent to the fence, regardless of the side that is developing.

9-5 INTERIOR GRADING -- Differences in elevations across interior property lines within a development, such that slopes or retaining walls are required, shall conform to the Standard Drawing 2-2 and the following:

A. Property Lines -- Property lines shall be situated at the top of fill and cut slopes. It is desirable that surface flow does not drain onto new slopes steeper than 5:1. Grading shall be such that surface runoff will not be concentrated at the top of slopes, but will be allowed to sheet flow down the slopes.

Property lines shall be situated at the top sides of retaining walls with a minimum setback of 1.0 ft from the property line to the retaining wall. See Standard Drawing 2-3.

B. Slopes -- earth slopes allowed shall be 2:1 or flatter (horizontal to vertical). Steeper slopes may be accepted based on Soils Engineer's recommendations. Minimum asphalt concrete surface slopes shall be 1%. Minimum asphalt concrete surface slopes shall be 1% and minimum cement concrete slopes shall be 0.25%. All proposed slopes shall be shown on the plans by some type of slope symbol delineation.

C. Cross Lot Surface Flow -- Grading of residential or duplex lots shall be such that surface flow shall be restricted to a maximum of one lot flowing across another lot. Developments with situations that mandate grading which allows more than one lot to drain across another lot shall be required to provide a pipe system to maintain the one lot rule. Any deviation from the above shall receive specific approval by the Director.

9-6 RETAINING WALLS -- Retaining walls, including limits, heights and construction details shall be shown on the development plans. Design calculations signed by the Consulting Engineer and including the registration number shall be required for all walls exceeding 30 inches in height or when a fence is an integral part of the wall.

Redwood retaining walls shall conform to the Standard Drawing 2-3 as a minimum design. When fences are to be constructed atop redwood retaining walls, 4 in. x 6 in. posts at 4 ft centers shall be used. All 4 in. x 6 in. posts shall extend above the retaining wall and act as fence posts. Alternate designs meeting UBC standards will be considered.

Wood retaining walls shall not be allowed adjacent to street rights of way.

All retaining walls on commercial and multifamily developments placed at the property line and exceeding 2 ft in height shall be either concrete or masonry.

Grading shall be such that onsite runoff, other than side slope areas, will not flow over wood retaining walls.

Where pads on adjacent lots are 10 ft apart and the difference in elevation exceeds 2.5 ft, a retaining wall will be required per Standard Drawing 2-3.

9-7 GRADING AT TREES -- Grading under trees with aesthetic value (trees with a 9 in. diameter trunk or larger, measured 4 1/2 ft above the ground, in healthy condition, and all oak trees) shall be given special attention. Every reasonable effort shall be made to avoid removing trees or creating conditions adverse to the tree's health. The natural ground within the dripline of trees, especially oak trees, shall remain as undisturbed as possible. Grading within the dripline of oak trees will not be permitted without adequate justification and approval by the Director.

Cross sections may be required where trees are located adjacent to roadways, new slopes or critical areas. In addition, a dimension from the face of a tree to some critical point or line may be required.

The following comments regarding oak trees shall be included on all improvement plans where oak trees are to be saved:

1. Only those oak trees marked with an "X" are to be removed during construction.

2. During construction, there shall be no grading, trenching, earth removal or addition, building pad formation or earth alteration of any kind within the dripline of any oak tree not marked with and "X".

3. During the construction phase of the project, a physical barricade shall be erected and maintained coincidental to the driplines of all oak trees not marked with an "X". Within this barrier no construction related activities shall be allowed including but not limited to vehicular parking or material storage.

4. The physical barricade shall be T-bars and 4 ft high hogwire fencing and shall be located a minimum of 3' outside the dripline of trees.

9-8 CERTIFYING PAD ELEVATIONS -- Upon completion of the grading and prior to acceptance of the subdivision improvements by the City, the Consulting Engineer shall verify the final pad elevations. The elevations shall be verified at the center and the corners of each pad. Elevation deviations or more than 0.20 ft shall be noted on the tracings.

A signature block, certifying that final graded elevations in the field are the same as those shown on the plans, shall be included on the tracings of the subdivision grading plans. The Consulting Engineer shall sign the signature block, certifying to the above, and shall provide one set of reproducible and two sets of as-built grading plans to the Director. See City Standard Drawing 1-11.

SECTION 10

SOUND BARRIER DESIGN

10-1 LOCATION REQUIREMENTS -- Sound barriers may be required along the rear and side property lines of residential developments adjacent to freeways, major highways and other ground level noise elements in order to achieve the noise control objectives of the City of Rocklin Noise Element and Noise Ordinance.

10-2 SOUND STUDY -- When it appears to the Director that a sound barrier may be necessary or when a sound barrier is a condition of development, a sound study prepared by an Acoustical Consultant shall be submitted to the Department of Community Development before the improvement plans will be approved by the Director. The sound study shall include a recommended height, material and termination limits for the sound barrier including all backup material leading to the recommendations.

10-3 DESIGN -- The sound barrier shall be designed to attenuate to acceptable noise levels at the affected property line consistent with the noise elements of the Rocklin General Plan.

10-4 PLAN REQUIREMENTS -- All construction details for sound barriers, including the locations and limits, shall be shown on the site improvement plans.

SECTION 11

SURVEY MONUMENTS

11-1 SURVEY MONUMENTS, SUBDIVISIONS -- Materials and workmanship shall conform to the requirements of the California Land Surveyors' Act and local standards and regulations. The Consulting Engineer shall place survey monuments at the following locations within their improvements:

A. At the intersections of all street centerlines.

B. At the beginning and end of all curves on the street centerlines.

C. At all subdivision boundary corners designated by the Director: at the intersections of subdivision boundaries with street centerlines; and such other locations so as to enable any lot or portion of the improvement to be retraced or located.

D. The above described monuments shall be as follows:

1. Section and quarter section corners shall be not less than 2 in. inside diameter galvanized iron pipe 30 in. long. The pipe is to be capped and marked in accordance with the instructions in Chapter 4 of the 1973 Manual of Instructions prepared by the Bureau of Land Management.

2. Subdivision boundary monuments, except those in street pavement, shall be not less than 1 1/4 in. galvanized iron pipe, 30 inches in length, capped and tagged.

3. Subdivision boundary monuments in street pavement shall be not less than 3/4 in. galvanized iron pipe, 18 inches in length (tagged or stamped). Top of pipe shall be driven flush with the surface pavement.

4. All survey points described in Section 11-1 A and 11-1 B shall be marked with a 3/4 in. iron pipe 18 inches in length (tagged or stamped); or a railroad spike (stamped) by the Engineer or Surveyor. The pipe or spike shall be driven flush with the finished surface of the pavement.

   However, in addition to the above, each Subdivision shall have not less than two centerline points, marked by box monuments and in Subdivisions exceeding 3,000 feet of centerline, intervisible box monuments shall be set at a ratio of two intervisible monuments per 3000 feet of centerline.

Box monuments shall be as shown in the Standard Drawing 3-34.

5. All centerline monuments shall be referenced to permanent objects located nearby and all ties shall be furnished to the City Engineer for general public use. Final approval of the subdivision will not be made until such ties have been furnished to the City Engineer.

E. Found monuments which are used to establish lines of the property being surveyed shall be rehabilitated to city standards when found in a perishable condition. In any case, such monuments if unmarked shall be marked with the user's registration number.

F. Survey monuments shall be placed by the Consulting Engineer at all section corners, quarter corners, and centers of sections within the improvements and off-site, due to deed dependency, as required by the City Engineer.

G. The Consulting Engineer shall place a note on all construction plans stating that:

1) The Contractor is responsible for the protection of all existing monuments and other survey markers.

2) That no final acceptance of the construction shall be issued until the survey monuments are in place and the centerline monument ties are furnished to the City Engineer's office.

SECTION 12

LANDSCAPING

12-1 GENERAL -- The following Design Standards must be considered during the design of projects and incorporated into the plans and specifications where applicable. Projects must also be in accordance with the Standard Specifications for Public Works construction. Whenever special requirements conflict on any subject matter, the Director shall determine which special requirement will govern.

12-2 GRADING AND DRAINAGE

A. Parkway drainage and common area drainage will not be allowed to drain onto private property. Design must incorporate provisions to minimize drainage over sidewalks and prevent ponding in parkways. No concentrated flow shall be allowed over curbs, sidewalks, and property lines.

B. Subsurface drains shall connect into storm drain system. A secondary drainage path must be provided where grate inlet-type basins are used for drainage. Grate inlet type basin shall not be used where leaves or other debris may clog the grates. Steel drain lines shall not be used.

C. Turf areas shall have a minimum slope of 2% and a maximum slope of 20%.

12-3 EROSION CONTROL --

Cut slopes 2:1 and steeper, 5 ft or more in height and fill slopes 2:1 and steeper, 3 ft or more in height, shall require special design provisions be made to control erosion and runoff.

12-4 SIDEWALKS --

A. Sidewalks shall be constructed with a 4 ft minimum width if parkway is between curb and sidewalk, a 5 ft minimum width when adjacent to curbs, and a 6 ft minimum width if cars are to overhang the walks when parked.

B. Sidewalks adjacent to the curb shall have a cross slope of 1/4 in. per foot. It will be necessary to provide grades and alignments on concrete sidewalks within the parkway in accordance with the design features desired.

C. Public sidewalks shall be constructed as per City Standards. Private sidewalks shall be constructed as recommended in the approved soils report.

D. Special paving shall not be allowed in streets, sidewalks, or intersections without prior approval of the Director.

E. Handicap ramps shall be provided as required at street intersections and at other locations where sidewalks terminate at full height curbs, and shall comply with the Standard Drawings.

12-5 VEHICULAR SIGHT REQUIREMENT

If the project includes intersections or driveways onto public streets, the plan shall show the intersection, driveway and approaches, noting vehicular sight distance as required by the Standard Drawings.

12-6 MEDIANS AND PARKWAYS

A. Turf areas of parkways and medians shall be 6 ft wide, minimum. Shrub or groundcover areas shall be 4 ft wide, minimum.

B. A 12 in. wide concrete mowstrip shall be required adjacent to curbs within all turfed landscaped medians. An 8 in. concrete mowstrip shall be required along walls and fences adjacent to turf areas. A 6 in. concrete mowstrip shall be required between turf and groundcover areas.

C. Medians shall have a cross slope of 2% for both turf and groundcover areas unless the median is specifically designed for a special landscape treatment.

12-7 IRRIGATION

A. All irrigation systems shall be designed to minimize vandalism (with special consideration in parks).

B. Water velocity in system shall not exceed 5 ft per second.

C. All irrigation systems shall have the design capability of delivering 1 1/2 in. of water in a 5 day period. Watering time shall be between the hours of 10:00 P.M. and 6:00 A.M.

D. City maintained irrigation systems shall be designed to connect to the Central Computer Controller by a nondedicated phone line and shall include moisture sensing and flow sensing capabilities.

E. Irrigation systems shall be designed to apply water at a rate which does not exceed the infiltration rate of the soil, and systems shall be programmable to prevent ponding and minimize runoff.

F. Irrigation systems shall be designed to meet the peak moisture demand of all plant materials used within the design area. Individual station run time shall meet peak evapotranspiration (E.T.) rate. Separate remote control valves shall be used for shrub and groundcover areas versus turf, with sun and shaded areas also segregated.

G. On all slopes or mounded areas requiring irrigation, lateral lines shall be installed parallel with contours. Provide separate remote control valves for sprinkler lines operating systems at the top, toe, and intermediate areas of slopes.

H. Irrigation system shall be designed and operated to eliminate fogging and minimize overspray and discharge onto nonlandscaped areas.

I. The following specific constraints shall be adhered to during the design and any subsequent modification of irrigation systems using reclaimed water:

1. Cross connections between potable water systems and other water systems are not permitted.

2. Hose bibbs are not permitted on irrigation systems using reclaimed water.

3. Drinking fountains must be protected from the direct spray of reclaimed water by either proper placement of the drinking fountain or use of a covered fountain approved for this use.

J. Irrigation systems shall be designed to provide uniform coverage throughout each system.

K. Sprinkler heads used in turfed play areas shall be equipped with protective covers.

L. All sprinkler heads shall be pop-up type.

M. Sprinkler Heads:

1. All sprinkler heads shall be spaced to not exceed 50% of the spray diameter (head to head coverage).

2. In large turf areas and any area exposed to consistent winds, sprinkler heads shall be spaced to not exceed 45% of the spray diameter.

3. Sprinkler head spacing in medians and parkways shall not exceed the width of the landscape area.

4. Large turf sprinklers with different patterns or different precipitation rates shall be operated by separate remote control valves.

N. System design pressure shall not be greater than lowest available pressure during the previous 2 yr period per PCWA records.

O. Master valves, pressure regulating valve, and basket strainer equipment shall be required on all irrigation systems unless (domestic water and reclaimed water) otherwise approved by the Director. The strainer shall be located immediately downstream of the water meter.

P. Gate valves shall be provided to allow shutting down various sections of the system independent of the entire system, and on the supply side of a line beneath a street.

Q. Backflow Prevention:

1. All backflow prevention devices shall comply with requirements of Title 17 of the California Administrative Code, Placer County Health Department, PCWA, and City of Rocklin. Reduced pressure type backflow preventors are required for irrigation systems using domestic water. Gate valves shall be ball valves.

2. System design shall prevent any back siphonage after system valves are closed.

3. Backflow prevention devices are not permitted on irrigation systems using reclaimed water.

R. Remote Control Valves:

1. The following criteria shall be used for locating remote control valves:

- Locate valves in groundcover or shrub areas when possible.
- Locate valves outside of designated athletic play areas.
- Locate valves adjacent to paving to facilitate access.
- For slopes, locate valves either at the top or toe of slope.

2. Install remote control valves independently in green plastic valve boxes.

S. Quick Coupling Valves:

1. Provide quick couplers a minimum of 100 ft on center in recreational areas and 200 ft on center in general landscaped areas. Provide one quick coupler within 12 in. of paved end sections of landscape medians, and at

the end of main line runs 200 ft and longer. Quick coupler valves shall be installed in green round plastic gate valve boxes.

2. Quick couplers shall be located outside of designated athletic play areas and within an area of 12 to 18 in. from hardscape where possible.

3. Provide two quick coupling valves at each baseball field. Valves to be located at first base and third base adjacent to fence or dugout.

T. Stub-out requirements for future systems extending beyond the limits of the current project, for mainline piping and components shall be determined by the Director.

U. Drip irrigation or subterranean irrigation may be used with prior approval of the Director. Design shall include manufacturer's specifications.

V. Anti-drain valves (inline and/or under sprinkler heads) shall be installed on all slopes greater than 5%. Inline anti-drain valves shall be installed in approved valve boxes.

12-8 PLANTING

A. All plant material shall be in accordance with the appropriate ordinances, resolutions, and specifications established by the City.

B. All plant material shall be in conformance with City-approved Streetscape/Street Tree Master plans where applicable. The City retains the right to prohibit any plant material generally known to require excessive maintenance, because of factors such as, but not limited to, disease, pest control, troublesome root development, ultimate size, and difficult growth habits.

C. The use of drought tolerant plant materials that are particularly compatible with our local environment is encouraged to promote water conservation and reduce maintenance costs.

D. Parkways adjacent to industrial, commercial, and institutional areas shall be maintained by the adjacent property owner.

E. No trees shall be planted within right of way in industrial areas.

F. In addition to minimum setback requirements for certain species as shown on the Tree List, the following minimum distances shall be required:

1. Three feet from City maintenance limit line.

2. Four feet from utility installations including, but not limited to sewers, gas, water lines, meter vaults, catch basins, etc.

3. Ten feet from driveways.

4. Ten feet from fire hydrants.

5. Twenty feet from light standards.

6. Tree limbs must have a clearance of 14.5 ft over streets, 8 ft over bicycle trails, and 7 ft over pedestrian-traveled ways.

G. Minimum sizes of trees shall be 15 gallons or as approved by the Director.

H. All turf shall be installed by hydroseeding or stolonizing unless alternative methods receive prior approval by the City Engineer.

12-7 LIGHTING

A. All accent lighting shall be located on private property.

B. All street, park, trail, and paseo lighting shall be vandal resistant, and have high pressure sodium vapor lamps.

C. All lighting shall be designed to conform with Section 8 and the requirements of PG&E.

12-8 TRAFFIC EQUIPMENT AND INSTALLATION

All traffic equipment and installation shall conform to Caltrans Standard Plans and Specifications.